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### ON PSYCHO-ANALYSIS.<sup>1</sup>

By Prof. Sigm. Freud, Vienna.

At the friendly request of the Secretary of your section of Neurology and Psychiatry I take the liberty of directing the attention of this Congress to the subject of psycho-analysis, which at the present moment is being extensively studied by neurologists and psychiatrists in Europe and America.

Psycho-analysis is a remarkable combination, which includes not only a method of examination of the neuroses, but also a method of treatment based on the etiology thus discovered. I may say, to begin with, that psycho-analysis is not a child of speculation, but the result of experience, and for this reason, like every new product of science, is unfinished. Everyone is invited to convince himself by his own investigations of the correctness of assertions contained herein, and to help in the further development of the study.

Psycho-analysis began with researches on hysteria, but in the course of years it has extended far beyond this field of work. The "Studies on Hysteria," by Breuer and myself, published in 1895, were the beginnings of psycho-analysis;

they followed in the track of Charcot's work on "Traumatic Hysteria," Liébault and Bernheim's "Proof of the Hypnotic Phenomena," and Janet's studies on "Unconscious Psychic Processes." Psycho-analysis soon put itself into sharp antagonism with Janet's opinions, because (a) it refused to trace hysteria directly to a congenital hereditary degeneration, (b) it offered instead of a mere description a dynamic explanation by a play of psychic forces, and (c) it referred psychic dissociation (the importance of which had also been recognised by Janet) not to a psychic synthesis arising from a congenital disability, but to a special psychic process called "repression," (*Verdrängung*).

It has been directly proved that hysterical symptoms are residues (reminiscences) of impressive incidents, which have been withdrawn from everyday consciousness and are determined in form by details of the traumatic effects of these incidents in a way which excludes voluntary formation. In this conception the therapeutic possibilities consist of the chances of annulling such a "repression," so as to allow part of the unconscious psychic life to become conscious and thus deprive it of its pathogenic power. This conception is a dynamic one in so far as it regards the psychic processes as displacements of psychic energy, which can be estimated by the degree of their action on the affective elements. This is most significant in hysteria, where the process of "conversion" creates the symptoms by transforming a mental mass of emotion into somatic innervations.

<sup>1</sup> Reprinted from Australasian Medical Congress, Transactions, Ninth Session, Volume II, 1911, page 839.

The first psycho-analytic examinations and attempts at treatment were made with the aid of hypnotism. Afterwards this was abandoned and the work performed by the method of "free association," the patient remaining in his normal state. This modification had the advantage that the procedure could be applied to a far larger number of cases of hysteria, to other neuroses, and also to healthy individuals. The development of a special faculty of interpretation, however, became necessary, so as to draw conclusions from the expressed ideas of the examined individual. These interpretations established with all certainty the fact that the psychic dissociations are kept up solely by "inner resistances." The conclusion, therefore, seems justified, that they have arisen through inner psychic conflict, which has led to the "repression" of the underlying emotion. To overcome this conflict and thereby cure the neurosis, the guiding hand of the doctor trained in psycho-analysis is required.

Further, it has been very generally demonstrated that in all neuroses the morbid symptoms are really the end products of such conflicts, which have led to "repression" and "psychic cleavage." The symptoms are generated by different mechanisms: (a) either as formations in substitution for the repressed forces; or (b) as compromises between the repressing and the repressed forces; or (c) as reaction-formations and securities against the repressed forces.

The investigations were further extended to the conditions under which psychic conflicts lead to "repression" (i.e., dissociation caused dynamically), because it goes without saying, that a psychic conflict may in itself have also a normal ending. Psycho-analysis yielded as result, that the conflicts are always between sexual impulses (using the word "sexual" in the widest sense), and the wishes and tendencies of the remaining ego. In the neurosis it is the sexual impulses which succumb to "repression," and, consequently, form the most important basis for the genesis of symptoms, which, therefore, may be conceived as sexual gratifications in substitution.

Our work on the question of pre-disposition to neurotic affections has added the "infantile" factor to the hitherto recognised somatic and hereditary factors. Thus psycho-analysis had to trace back the psychic life of the patients to their early infancy and the conclusion was arrived at that mental arrests of development (infantilisms) harbour predisposition to the neuroses. We have learnt, particularly from the tracing of the sexual life, that an "infantile sexuality" does really exist, that the sexual impulse is made up of many components and passes through a complicated development, the final result of which is, after many restrictions and transformations, the "normal sexuality" of the adult. The puzzling perversions of the sexual impulse in adults appear to be either arrests of development, fixations, or one-sided growths. The neurosis is, therefore, the negative of the perversion.

The cultural development forced on mankind is the momentum which renders the restrictions and suppressions of the sexual impulse necessary, greater or lesser sacrifices being demanded according to the individual constitution. Development is hardly ever achieved smoothly, and disturbances may occur on account of the individual constitution or of premature sexual incidents, leaving behind the disposition to future neuroses. Such dispositions may remain harmless, if the life of the adult develops satisfactorily and unpretentiously; but they become pathogenic if the conditions of the mature life deny the gratification of the "libido," or make too high demands on its suppression.

From the investigations, which deal with the sexual activity of the child, a further conception of the sexual impulse arises, which is based not on its purposes but on its sources. The sexual impulse possesses in a high degree the faculty of being diverted from its direct sexual goals, and of being led towards higher goals, which are no longer sexual ("sublimation"). The impulse is thus enabled to furnish most important contributions to the social and artistic achievements of humanity.

The simultaneous presence of the three moments—"infantilism," "sexuality," and "repression"—forms the

principal characteristic of the psycho-analytic theory, and marks its difference from other conceptions of morbid psychic life. Psycho-analysis has at the same time demonstrated that between the psychic life of normals, of neurotics and of psychotics there exists no fundamental difference, but only one of degree. The normal individual has to pass through the same "repressions," and has to battle with the same substituted or surrogate creations; the difference being only that the normal person performs these processes with less trouble and better success. The psycho-analytic method of examination can, therefore, also be applied to the explanation of normal psychic phenomena, and has made it possible to discover the close relationship between morbid psychic productions, and normal creations, such as dreams, the small blunders of everyday life, the valuable attainments of the joke, myths, and poetry. Of these the explanation of the dream is the farthest advanced and results in the following general formula: "the dream is a deformed fulfilment of a repressed wish." Dream interpretation has for object: removal of the deformity, which the unconscious thoughts of the dreamer have undergone; also it is a highly valuable aid to psycho-analytic technique, since it constitutes the most convenient method for obtaining insight into unconscious psychic life.

The tendency of contradicting the doctrines of psycho-analysis often occurs in medical and especially in psychiatric circles, without any real study or any practical application. This is due not only to the striking novelty and contrast of the doctrines when compared with those hitherto held by psychiatrists, but also to the fact that the premises and technique of psycho-analysis are much more nearly related to the realm of mind than to that of medicine. It is, however, beyond dispute, that the purely medical and non-psychological teachings have up to now done very little towards the understanding of the psychic life. The progress of psycho-analysis is further retarded by the fear of the average observer to see himself in his own mirror. Scientific man is liable to meet emotional resistances by arguments, and thus satisfy themselves to their own satisfaction! Anyone who does not wish to ignore a truth will do well to distrust his antipathies, and if he wishes to subject the doctrine of psycho-analysis to a critical examination, let him also analyse his own person.

I cannot believe that in these few sentences I have succeeded in painting a distinct picture of the principles and purposes of psycho-analysis, but I append a list of the principal publications on the subject, perusal of which will supply further enlightenment to those whom I have interested.

1. Breuer and Freud. Studien über Hysterie. 1895. Fr. Deuticke, Vienna. A portion of the above has been translated into English in "Selected Papers on Hysteria and other Psycho-neuroses," by Dr. A. A. Brill, New York, 1909.
2. Freud. Drei Abhandlungen zur Sexualtheorie. Vienna. 1905. English translation by Dr. Brill, "Three Contributions to the Sexual Theory." New York, 1910.
3. Freud. Zur Psychopathologie des Alltagslebens. S. Karger, Berlin. 3rd Edition, 1910.
4. Freud. Die Traumdeutung. Vienna, 1900. 3rd ed., 1911.
5. Freud. The Origin and Development of Psycho-analysis. Amer. Jour. of Psychology. April, 1910. Also in German: "Ueber Psychoanalyse." Five Lectures given at the Clark University, Worcester, Mass., 1909.
6. Freud. Der Witz und seine Beziehung zum Unbewussten. Vienna, 1905.
7. Freud. Collection of minor papers on the Doctrine of Neuroses. 1893-1906. Vienna, 1906.
8. Idem. A second collection. Vienna, 1909.
9. Hitschmann. Freud's Neurosenlehre. Vienna, 1911.
10. C. G. Jung. Diagnostische Assoziationsstudien. Two volumes. 1906-1910.

11. C. G. Jung. *Über die Psychologie der Dementia Praecox*. 1907.
12. *Jahrbuch für psycho-analytische und psychopathologische Forschungen*, published by E. Bleuler and S. Freud, edited by Jung. Since 1909.
13. *Schriften zur angewandten Seelenkunde*. Fr. Deuticke, Vienna. Since 1907. Eleven parts, by Freud, Jung, Abraham, Pfister, Rank, Jones, Riklin, Graf, Sadger.
14. *Zentralblatt für Psychoanalyse*. Edited by A. Adler and W. Stekel. J. Bergmann, Wiesbaden. Since Sept., 1910.

### PARANOID STATES: CLINICAL PICTURES.<sup>1</sup>

By B. H. PETERSON, M.C., D.P.M.,  
Sydney.

In discussing the clinical pictures seen in paranoid states I will lay stress on a particular type of syndrome seen in New Australians. There seems to be no point in describing the well-known clinical features of paranoid schizophrenia, paraphrenia and paranoia, though of course these diseases are seen in migrants as in other subjects; and in the limited time available I do not wish to be drawn into the controversy concerning the classification and nomenclature of paranoid states in general. The condition that seems to merit discussion in this context may be called "paranoid reaction", for want of a better term. Paranoid reactions are relatively short-lived illnesses with a good prognosis, occurring in predisposed individuals (or even in apparently normal individuals) under stress. The stress may be a physical illness involving admission to hospital (it is not uncommon to see mild paranoid reactions in the wards of a general hospital), imprisonment for legal or military reasons, or migration to a strange country, in all of which situations the patient finds himself under some form of stress in unfamiliar surroundings. Here we are concerned with the migrant, who easily finds material for distrust in trying to adjust himself to new social customs, and the language difficulty may add fuel to the fire. We are all prone to misinterpret conversation which is only half understood. Similar reactions are seen in the partially deaf.

Many of these patients are adolescents or young adults. Those predisposed to develop paranoid reactions are sensitive and emotionally labile, proud yet lacking in self-confidence, and often there is a sense of guilt over some secret habit or circumstance, such as masturbation or infidelity. Then some misunderstanding, or some actual or imagined insult or suspicion, increases the patient's feelings of guilt and insecurity, and he begins to think that people are looking at him accusingly or conspiring against him. There develops increasing anxiety and finally an agitated depression. There may be some emotionally determined clouding of consciousness with hallucinations and mild confusion. Mayer-Gross, Slater and Roth (1954) stress the psychogenic nature of the syndrome, because removal of the patient from the environment involved in his delusions, with appropriate therapy, results in recovery in some weeks or months, an intact personality being left. An illustrative clinical history follows.

A, a Hungarian woman, aged forty-six years, married to a rubber worker, and the mother of four children, was admitted to a metropolitan mental hospital on November 30, 1954. The certificates stated that she was apprehensive, suspicious, agitated and restless, and convinced that the newspapers contained statements that she was wicked and unclean. She heard similar statements over the radio, and she said that she could hear a woman's voice in the next room calling her. She felt that something dreadful would happen and asked for help and protection. The history was that she had recently obtained a housekeeping job, and her

husband lived in with her. Three weeks before her admission to hospital, the house was robbed, and she got the idea that she was being unjustly blamed for this (though she was not actually under suspicion). A week later she told her husband not to go to work, as she was sure the premises were to be searched and that they were being watched. She could hear the horns of detectives' cars and voices saying nasty things to her in German and Hungarian, and she became very suspicious of the neighbours and of her husband. Finally she became so agitated that certification was advisable.

No abnormality could be found on physical examination of the patient. Her English was slow and halting. She had been born in Hungary, the daughter of a plumber, and she was brought up in poor circumstances. She had had eight years' schooling and later married. During World War II they lived in great fear, and she was raped by Russian soldiers. Her third child was born in Budapest during an air raid. She witnessed the shooting of many of her friends, and lived in cellars and hillside caves, separated from her husband. After a period in a refugee camp, the family migrated to Australia in 1950, but they have had no settled home and little privacy since their arrival. She has a good husband, and she does not smoke or drink. She knows of no family history of psychiatric illness. She has always been of retiring disposition and easily upset, but has had no previous major breakdowns in spite of her hardships. Her social relationships in Australia were made more difficult by language difficulties. She had been worrying about her aged parents still in Hungary, and about her children's health. In hospital she was given a course of seven electroplexies and recovered in a month.

A similar syndrome in young Polish migrants to England shortly after the war was described by Kino (1951). They also recovered with electroplexy and superficial psychotherapy, and Kino regarded the syndrome as a specific psychiatric entity. However, it is difficult to decide whether the primary disturbance is one of affect or of misinterpretation of events or of the attitudes of others in the environment. Worries, social maladjustment and loneliness easily induce a mood of depression, which in turn may falsify judgement and perceptions. My own clinical impression of these cases is that they are basically affective reactions with a paranoid colouring, occurring usually in individuals with a mildly paranoid type of personality subjected to a particular type of stress situation. The features of this stress situation in migrants have already been presented. With regard to differential diagnosis, paranoid reactions may be hard to distinguish from paranoid schizophrenia when seen in the acute phase. Paranoid schizophrenia is certainly much commoner, and the course and outcome of the illness should ultimately establish the diagnosis. In acute paranoid psychoses some organic cause should always be thought of and excluded in the early stages. It has been pointed out that paranoid reactions are not rare in physical illnesses, especially those associated with toxæmia and exhaustion. Confusional psychoses with a paranoid colouring must also be considered.

Another condition worth discussion is paranoid psychopathy. Paranoid traits arise during personality development as the result of a need for defence against repudiated instinctive drives, feelings of insecurity, guilt, or failure to achieve overvalued goals. Inherited predisposition is often an important factor. By the mechanism of projection the paranoid person enhances his self-esteem by criticizing others, and relieves his guilt by blaming someone else. These tendencies are usually shown even in childhood. The future paranoid psychopath is a stubborn, suspicious, secretive, lonely and insecure child. As he grows older he becomes increasingly sensitive about the attitudes and behaviour of others, and is always suspecting that they wish him harm. He becomes resentful, egotistical, humourless, rigid, argumentative, aggressive, intolerant, jealous and exacting. These patients are misfits in society. They make bad husbands, wives and parents, and hence are often referred by marriage guidance and other social agencies. Their therapeutic management is difficult. Some seem to remain in a state of relatively mild psychopathy, showing no further progression. Some possess hypomanic excess of energy, and are constitutionally hyperthymic; these patients show paranoid fanaticism

<sup>1</sup>Read at a meeting of the Section of Neurology and Psychiatry, Australasian Medical Congress (British Medical Association), Ninth Session, Sydney, August 20 to 27, 1955.

and persistent litigiousness. Others are viciously anti-social and become dangerous and incorrigible criminals. Yet others gradually and insidiously develop into paranoid psychotics, and often present an insoluble and tragic problem to their relatives and to their psychiatrist until they become certifiable.

In closing I should like to quote the words of the English psychiatrist Crichton-Miller (Noyes, 1949):

For every fully developed case of paranoia in our mental hospitals there must be hundreds, if not thousands, who suffer from minor degrees of suspicion and mistrust; whose lives are blighted by this barrier to human harmony; and who poison the springs of social life for the community.

#### Acknowledgements.

I wish to thank the Inspector-General of Mental Hospitals in New South Wales, Dr. D. S. Fraser, and the Medical Superintendent of Gladesville Mental Hospital, Dr. G. A. Ross, for access to their case records.

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- KINO, F. F. (1951), "Allens' Paranoid Reaction", *J. Ment. Sc.*, 97: 589.  
 MAYER-GROSS, W., SLATER, E., and ROTH, M. (1954), "Clinical Psychiatry", 161.  
 NOYES, A. P. (1949), "Modern Clinical Psychiatry", 396.

### PARANOID STATES: SOCIAL AND CULTURAL ASPECTS.<sup>1</sup>

By IGNAZY A. LISTWAN,  
*Sydney.*

MODERN dynamic psychiatry stresses the importance of early personal experiences and conflicts in causing mental disorder. Recent developments point to the importance of conflicts occurring later in life and caused by difficulties in interpersonal relations. Social catastrophes like war and migration are particular and very drastic examples of those difficulties. It appears that the present age is particularly ridden with difficulties and conflicts and therefore it opens the door for investigations.

Make-up, personality, character, temperament are different in different cultures. Accordingly pathological reaction types, whether they are neurotic or psychotic, differ also. It is well known that inhabitants of the Mediterranean basin are emotionally unstable and excitable and that therefore they have the tendency to manic-depressive reactions, when mentally deranged. On the other hand, inhabitants of eastern European countries with their slowness, languidity and lack of temperament tend to schizophrenic reactions and particularly to the katatonic variety.

If we turn to primitive cultures, even today we can observe paranoid reaction types as described by Young. For example, in the tribe of Ekol of West Africa, ritualistic procedures deal with fear of magic which can be induced on one subject by other members of the family. The Kwakiutl Indians of the north-west Pacific coast indulge in self-glorification and delusions of grandeur. In the ceremony of *potlatch* the rival chieftains outdo each other in offering expensive gifts or in destroying highly valued property. At times they reveal homicidal tendencies to revenge the death of a relative, which has occurred in normal circumstances. Members of the Dobu tribe of New Guinea as a routine place the wife's family in the enemy group. They are constantly preoccupied with protection against poisoning by evil spirits populating the world. All these reactions are considered as normal in the culture in which they occur.

To return to our problem, the observation was previously made that migrants very frequently develop paranoid

states and paranoia-like reactions in cases of mental derangement. The question arises whether the above-mentioned reaction-type is due to their personality, or to their cultural and social make-up, or finally to factors operating in every migration and called for convenience "migration stresses". This problem is important in an era of massive movements of population with transplantation to new cultures.

#### Statistical Material.

An attempt was made to throw some light on the problem by analysing a group of patients examined in the psychiatry out-patient department of Sydney Hospital during a period of three years from June, 1952, till June, 1955. In this period I examined 244 new patients—that is, roughly one-quarter of the total number of new patients examined in the department. The number of visits was 1222, which averages five visits per patient. Forty-eight migrants were in the group, 20% of all patients. Forty-four patients were diagnosed as suffering from paranoid states in the whole group of all patients, and 17 of the 48 migrants; roughly twice as many migrants as native-born were paranoid. Of the group of 17 paranoid migrants, 12 belonged to eastern European countries like Hungary, Poland, Russia, Yugoslavia, Czechoslovakia. Of 17 paranoid migrants, 13 were unmarried, 14 were males, and 12 were in the early middle-age groups, between twenty-five and thirty-five years.

The foregoing material is not big enough to have statistical value. However, it is admissible to speculate on the above-mentioned figures. The following observations seem justified: (i) Paranoid states in patients seeking psychiatric help occurred nearly twice as frequently in migrants as in the native-born. (ii) Migrants suffering from paranoid states come mostly from eastern Europe. (iii) All patients with paranoid states were predominantly male, unmarried, and young adults. (iv) Paranoid patients have a tendency to escape from psychiatric care, as evidenced by the number of visits paid to the department.

Clinically the paranoid states met with in the present series have certain common characteristics. They can be compared with cases described by Allen (1920), by Schneider (1930), by Kino (1951) and by Fenyes (1953). They have been variously called "primary delusions of reference", "persecutory delusions of linguistically isolated persons" and "allens' paranoid reactions". A summary of four typical cases is given in order to illustrate the common features.

#### Reports of Cases.

CASE I.—A, aged thirty-two years, an unmarried man, was a painter by profession, but a labourer at present. He was a Hungarian national, who had arrived in Australia four years earlier. He had been through the war in Europe and had spent a few years in concentration camps. He visited the department twice, and then stopped coming. He complained of sexual difficulties for the last two years, characterized by incomplete erection and premature ejaculation. He had consulted a doctor about it; the doctor experimented on him, wanted to "withhold pleasure from him", inoculated diseases on him with tablets. The patient had been in concentration camps and knew that those experiments were carried out.

CASE II.—B, aged thirty years, an unmarried man, was a draftsman by profession, but a labourer at present. He was a Czechoslovakian national, who had arrived in Australia three years earlier; he had been through the war in Europe and had spent some time in displaced persons' camps. He visited the department five times. He complained that for the last twelve months people were making tests on him, and therefore he feared to meet them. Voices told him: "Bad character, don't do it, you are a fool." He heard these voices specially on trams and buses. A political organization was behind them.

CASE III.—C, aged thirty-four years, was a married man, a clerk by profession, but a labourer at present. He was a Polish national, who had arrived in Australia four years earlier. He had been through the war and concentration camps. He visited the department twice. He complained of difficulties at work; his mates at work commented on his behaviour, spied on him in the street, reported him to the

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police. He was guilty of some misdoings of a political nature during the war, but he could not explain what they were. He reported to the police several times, demanding imprisonment. He would not believe that he had not committed any crimes.

**CASE IV.**—D was an unmarried male patient, aged thirty years, a painter by profession, but a labourer at present. He was a Polish national, who had arrived in Australia five years earlier. He had been through the war and had spent a particularly long time in one of the worst concentration camps. In that camp he was all the time under the threat of death. When he left the camp, he continued to fear that he might be killed. He projected that attitude into the sexual area and developed masochistic tendencies. Finally he would not have any sexual excitement without the accompanying threat of death artificially produced by his partner. He then reprojected that paranoid attitude back into the social area, and began to think that he might be killed by the police because he was a masochist. He finished in a state of panic that his execution was imminent. This patient was one of the very few who had to be certified insane.

In all these cases chosen as example and in others running on the same lines there is no history of previous mental disorder, although the subjects spent years under nearly unendurable stresses in concentration camps and displaced persons' camps. They were mostly in the young age group, lonely males, and they mostly had to change their profession after arrival in Australia. They spent the first two years after their arrival in camps or hostels under contract in their own or similar national groups. Their breakdown usually occurred, not immediately after arrival, but some time later, and in many cases after they had left the camp and faced responsibilities, financial insecurity, change of occupation and loneliness.

Their delusions have the following characteristics: They are usually based on some war experiences. Police and political organizations are involved. There is a threat of death. The patients are punished for previous misdoings. The delusions are localized and never bizarre. They frequently do not incapacitate the patients and allow them to continue their work. Particularly in primitive personalities, they are frequently coloured by a mono-symptomatic bodily complaint, particularly of sexual nature. In that respect they approximate an hysterical conversion symptom. In such cases the outlook is poor.

#### Dynamics Involved.

There must be dynamic reasons for the repetition of the clinical picture so characteristically in many cases. There is no doubt that the social factor is important. Displaced persons are not only displaced horizontally to a new country with a new language and new jobs; they also are displaced vertically to a lower economic and social level. Needless to say, they are uprooted from the family circle and exposed to loneliness and adaptation stresses. Eastern European countries are mostly agricultural countries; the notion of mother-country and the attachment to mother soil is logically stronger in a peasant than in an industrial community. One could speculate that the mother-country represents symbolically the patient's mother. Both are nourishing and both give oral pleasures. (The Bible says: "Land of promise, flowing with milk and honey.") By being uprooted the patients have lost both. They have also lost other symbols: their mother language and frequently their name. Their own language and their own name become to a great extent bound up with personality. They also represent primary and important links with family and country. Their Oedipus complex is unresolved; they have guilt feelings not only for killing their parent in the Oedipal situation, but also for killing in reality. Many of them left their parents behind when leaving their country, although they knew, or at least suspected, that their parents might be annihilated. Guilt for having remained alone also plays a role. Because of unresolved fixations at the genital level they regressed to the earlier stages of pregenital organizations. They could not derive oral gratification because of lack of a mother-figure, and perhaps also because of lack of their own language and the food they have been used to, both important factors in oral gratification.

Language particularly seems to be an important factor. Slavish languages are lip languages, in which mostly the front of the mouth including the tip of the tongue and the lips are used. They are more sensitive and perhaps gratifying when spoken than the guttural languages. Besides, one's own language carries an emotional value of high intensity.

Thus the oral gratifications are not available to the extent needed. They become at times depressed owing to introjected hostility, but more frequently regress to the anal stage. We know that that early organization level, when the subject regresses to it, is responsible for paranoid projections. In the case of the patient D we see this level clearly. In his case also another factor is stressed: that the paranoid projections primarily were due to a real-life situation, and that only later, when that life situation changed, the real threats changed into delusions, and then these delusions were handled dynamically and could be explained by a regression to a pregenital level. That is a very important feature; we must not forget that in the cases discussed and probably in many others, not only is the constitutional make-up important, not only the dynamic development according to analytical rules, but also the real-life situation at a certain stage of development. Personality patterns are fixed in infancy, but conditioning of social types takes place later. The tendency to react with neurotic symptoms rooted in childhood is activated by recent hardships, and the conditioned responses are reformulated. Serious social factors revive infantile conflicts. We must also not forget that that life situation occurs in a grown-up life period. Finally, people living for their family, their business and physical security are more easily uprooted than people who have intellectual, religious and political ideas. Simple personalities and hysteroid types are more likely to succumb.

#### Practical Conclusions.

Is there any practical conclusion to be drawn from the material presented and from the speculations made? Can these people be helped? Medical management of paranoid states will not be discussed in this paper. Social management is perhaps possible. It may have not only therapeutic, but also prophylactic value, and then it will be applicable not only to the deranged, but also to the healthy.

The main avenues of approach are visualized as follows:

1. New Australians should be encouraged to learn the native language as soon as possible, including emotionally coloured language, like poetry and plays.
2. Opportunity should be available for the mother-language to be continued, to be used in the family circle and in the subject's own cultural groups.
3. A substitute for mother-country and other mother figures should be looked for, (a) by encouragement to marry and establish a family as soon as possible, (b) by encouragement to form national and cultural groups, societies and clubs.
4. New Australians should be desensitized from their paranoid reactions to authority like the police force, government offices, *et cetera*, by guidance and reeducation.

#### Summary.

Certain paranoid reaction types occurring in migrants are due mostly to social factors summarized as "migration stresses". They are purely environmental and have a good prognosis. The patients improve remarkably well when social adjustments and reeducation are undertaken. These reactions should therefore not be considered as mental disorders in their real meaning, and patients afflicted with them should be considered as quickly recoverable potential assets to the community.

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### PARANOID REACTIONS.<sup>1</sup>

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In this paper I propose to deal with paranoid reactions in the various psychiatric entities in which they are found, especially with reference to displaced persons. Projection, resulting in persecutory misinterpretation of various manifestations of xenophobia, or of the normal but aggressively tinged reactions of an alien culture, or resulting in definite delusional formation, commonly occurs in these victims of a wider paranoid national reaction in the usual psychiatric disorders coloured only by cultural differences and the unusual traumatic stresses which they have often suffered for many years—psychoneurotic pseudoparanoic reactions, schizophrenic reactions and depressive states. In addition, as was mentioned by a previous speaker, there is the more benign "paranoid reaction of aliens"—more benign in that it has a better immediate prognosis, and that even when recovery does not occur, the reaction tends to be circumscribed and less systematized than in other paranoid reactions, and therefore more subject to manipulation of the environment.

In these displaced persons—and it is preferable to use this term as indicating the more important psychodynamics—diagnosis is frequently difficult owing to language difficulties, and therefore there is a temptation to have speedy recourse to physical treatments. However, patient unravelling of the subject's story will frequently change the picture from what at first appeared as psychotic delusional formation to the true picture—a psychoneurotic response to xenophobia and to normal, but alien, interpersonal relationships.

In the psychoneurotic, paranoid interpretations of rejection and aggression frequently accompany psychoneurotic depression, especially when, as often happens, the patient has originally held social or occupational positions of much greater prestige than the one in which he functions in Australia; or, in the still younger person, when his ambitions, frequently justifiably high from the prestige point of view—and in western culture this means mainly from the point of view of income—have been shattered and he is reduced to the level of labourer or clerk,

inadequate demands being made upon his abilities. In these cases we are justified in being more directive than is usually desirable, and we thus seek, with the patient, opportunities for cultural and occupational progress; thus we make more instead of less demands upon the patient and provide him with means for self-expression, achievement and recognition.

Similar projective mechanisms frequently manifest themselves in the large group of psychoneurotics that we find in the children of displaced persons—those born in Australia or too young to have adopted the social culture of their native land. In their adopting country they grow up in a culture frequently completely opposed to the authoritarian family life, with its stress on ancestor worship, which is much more common in Europe.

Here manipulation of the environment is not possible. The frustrations imposed by the autocratic parent continually reactivate the ambivalences of the child, with alternating feelings of resentment and guilt and continual feelings of doubt and bewilderment. It is rare to find the parents anything but completely rigid and immovable, and it is the task of the psychiatrist to assist the child to rebel, even at the cost of the temporary, but often expressed, disapproval of the parents. These young people are very insecure and need a great deal of supportive as well as insight therapy.

Mixed states, in which paranoid trends are freed by a cyclothymic depression, call for little comment. They generally yield rapidly to standard electroconvulsive therapy, followed by psychotherapeutic discussions in reference to the paranoid content after the patient has recovered.

The remaining two large groups—early paranoid schizophrenia and alien paranoid states (sometimes referred to as paranoid states in the linguistically isolated)—need careful discrimination. This is frequently difficult in displaced persons, not only on account of the obstacles presented by the difficulties of communication, but also because it is the general rule to find no relatives or close friends from whom one may obtain a longitudinal history. Diagnosis therefore depends upon the unsatisfactory cross-section presented at interview.

The paranoid schizophrenic, of course, is dealt with along orthodox lines. In the alien paranoid states there is generally little or no involvement of the total personality; here we are generally dealing with a loosely organized delusional system, frequently accompanied by various hypochondriac symptoms. The latter the patient tends to rationalize as due to climatic conditions. They tend to precede the paranoid symptoms, and the patient travels from State to State in a vain search for the optimum climate.

These patients can frequently be treated without admission to hospital. They do not need, and rarely respond to, electroconvulsive therapy, probably because the paranoid state is the primary reaction and the associated depression, generally mild, is secondary. Their behaviour tends to be asocial rather than antisocial.

Management of these patients must be strictly adapted to the individual patient, and depends partly on suspected psychodynamics and partly upon the supposed persecutor. When the latter is an individual, removal of the patient from the persecutor is essential, and although in general these patients tend less to violence than in other paranoid reactions, it should never be considered safe to allow the paranoid and the persecutor to remain together. The favourable effect of removing the patient from an unfavourable environment is illustrated by the following history.

A Pole, aged twenty-eight years, presented with mild delusions of persecution at the hands of his fellow employees. The "persecutor" was the foreman, the other employees being regarded as influenced by him in their inimical attitude to the patient. He "knew" by their signs that they regarded him as a homosexual; they were conspiring to frame him and have him arrested; they deliberately used words with which he was unfamiliar to make him embarrassed and blush, and this was taken as further evidence that he was homosexual.

<sup>1</sup>Read at a meeting of the Section of Neurology and Psychiatry, Australasian Medical Congress (British Medical Association), Ninth Session, Sydney, August 20 to 27, 1955.

Like most of these patients, he was a man of restricted interests—not of choice, as is the case with the paranoid schizophrenic, but as the result of the impossibility of developing any permanent interests or personal relationships in his life of enforced continual change. When not working, he spent most of his time alone, brooding over and elaborating his paranoid fears.

It was not possible to give him any real insight. However, it was thought that the homosexual flavour of his delusions was the result of general insecurities rather than of any real homosexual conflict, and he was induced to take a job on the Snowy River project, where the environment is relatively constant, and where work is the main interest of all, so that there is a greater sense of being in a group with a common object; this produces some degree of social identifications, and the rapidly increasing savings produce some security and a sense of personal worth. The patient remained there for over twelve months before paying a fleeting visit to Sydney; he had made a complete social adjustment, although he had not gained insight as far as the "persecutor" foreman was concerned.

Partial isolation as a result of language difficulties is recognized as an important factor in these cases. In cases in which it is not possible to change the environment, immediate attention should be paid to this factor. Generally, it is not sufficient to encourage the patient to attend English-speaking classes or to indulge in activities with the aliens of his adopting land. This is most desirable; but in addition it is generally helpful for him to take part in the activities of his compatriots, so that he develops some degree of social identification as soon as possible. However, it is stressed that the latter course is unwise without the former.

Occasionally these patients present a problem. They arrive in the consulting room with such obvious aggression accompanying their delusions that they are an obvious menace to the supposed persecutor. They arrive alone, and any request made at the end of the interview that they bring a friend or relative at the next interview is met by obstinate refusal or, more frequently, by failure to keep the second appointment. One realizes the potential dangers in these cases, but one is powerless to avoid this danger without betraying the confidence of the patient.

#### Summary.

Paranoid types of reactions in aliens occur in pseudo-paranoid psychoneurotic reactions, depressive states, schizophrenic reactions and the so-called "aliens' paranoid reactions". The first three are managed along orthodox lines. Aliens' paranoid reactions have a fairly good prognosis, and unless certification is necessary the patients are managed best by complete removal from the persecutor and the paranoid setting, by encouragement in rapidly developing an adequate command of English, and by developing temporary social relationships within their own racial group. The question is posed as to the action desirable in the care of potentially dangerous paranoid patients when there is no friend or relative to take action.

### PHYSIOLOGICAL ASPECTS OF ATHLETIC ENDEAVOUR.<sup>1</sup>

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THE effects of exercise will be discussed in relation to the various systems of the body, particularly the cardiovascular, respiratory and muscular systems; though it will be apparent that all systems are affected, and special effects are produced on the nervous and renal systems.

The heart in exercise increases its output per beat greatly; for example, from a basal resting output of 60 millilitres per beat the level may rise to 180 millilitres per beat in a well-trained athlete. One of Australia's leading racehorses, who had a large heart which is now pre-

served in Canberra, possibly had quite an inherent advantage over many other horses in this regard, though he did die relatively suddenly, allegedly of colic. In general in man, however, hypertrophy of the heart—that is, increase in muscle substance—is usually associated with evidence of increased work requirement at rest (for example, hypertension and valvular disease); though some hearts just simply hypertrophy for no apparent reason. The heart will then dilate in failure. On the other hand, lack of moderate muscular exercise is associated with reduced performance of the heart and other systems, notably the respiratory system. The left ventricle in the presence of mitral stenosis is small in size, in accordance with the obstruction to filling of the left ventricle and the cardiac patient, if he does not exercise himself within the limits of his heart's performance, also finds that his cardiac muscle is not favoured thereby. It is also becoming recognized by some medical observers that the sedentary life in itself may be a contributory factor to certain cardiac illnesses; though, so far as we are aware, heredity, the ability to handle certain lipins in the diet, the level of specific lipins in the blood, maybe diet itself and possibly stresses of life are all contributory factors. In this also the endocrines have been implicated. However, we are concerned with the effects of exercise on the healthy heart.

Physiologists are not at all certain how much blood is left in the heart at the end of systole. Once it was thought that emptying was complete, and Starling's law (namely, increased force of contraction associated with increased initial length of fibre) described a suitably geared mechanism to handle the situation. Most observers admit that some blood is left in the heart at the end of systole, but just how much is left is not certainly known. X-ray studies are stated to indicate that there is no increase in diastolic volume of the heart in exercise, which would mean that at rest there is a considerable residue. There are many technical difficulties in assessing this accurately, especially in view of rotational effects of the heart, the amount of width taken up by muscle wall and not by the cavity, and the fact that any changes in one dimension are cubed for changes in volume; for example, an increase in diameter of cavity of 20% yields an increase in volume of 75%, and an increase of 30% yields an increase of 120%. However, it is contended by the workers concerned with these X-ray studies that, with exercise, greater and greater amounts of blood are ejected per beat; so that at a maximum effort the ventricles are almost completely emptied.

Earlier studies have indicated that, while the ventricles do not empty completely at rest, the chambers contain only a reduced residue of blood—nothing like the 120 millilitres suggested by the later studies. All workers are not prepared to accept as yet that there is such a great residue normally. If we take the apex beat at nine centimetres from the sternum, the cavity width for both ventricles at the apex is approximately 6.0 to 6.5 centimetres, when due allowance is made for the muscle. Then a movement outward of the lateral extent of 0.5 centimetre (one-quarter of an inch) indicates an increase in cavity size of 1.0 centimetre in approximately four centimetres (since cephalically the heart width is less than at the apex); that is, a 25% diameter increase gives an increase in volume of about 100% or a change in output per beat from 60 to 120 millilitres of blood. After repeated exercise within the limits of tolerance the heart size may, by X-ray examination, appear actually reduced.

In maximal exercise, when a sufficient number of muscles are involved, it is considered that the maximum oxygen consumption depends on the maximum minute volume (output per beat by rate per minute) of the heart, and that this is a measure of the maximum working capacity. Thus the oxygen intake is related to the maximum cardiac output, which then limits the maximum working capacity. This applies only if there is no lung disease present. One might extend this observation to state that if the heart capacity is exceptionally great and the respiratory capacity is not unduly great, a stage may be reached where this relation no longer holds; that is to say, respiratory

<sup>1</sup>Text of an address delivered to the Victorian Sports-Medical Association on October 6, 1955.

capacity limits effort, though this possibility has not been referred to by workers in this field. If there is a limitation of respiratory function, as with lung disease, the maximum oxygen intake depends on both systems. Runners refer, from subjective feelings, to the limitations associated with respiration, and, of course, the preceding remarks apply only to maximal exercise—that is, many muscles being exercised to exhaustion. The situation is probably different with reduced continued activity, such, for example, as may occur in running one mile at about 15 miles per hour only.<sup>1</sup>

It has been recognized from investigations on Olympic cyclists and rowers (at the 1936 Olympic Games) that the cyclists were able to develop a greater horsepower when cycling than were the rowers when rowing. I pointed out, when this paper was presented in Canberra, that the cyclist was able to obtain a far better purchase for respiration by fixing the thorax through the serrate muscles to the arms, which were held at the handlebars, than could the rowers, whose arms were moving the oars powerfully. Likewise many runners after running to exhaustion have an impelling urge to hold the arms on to something firm—for example, the fence—presumably in order to aid respiration. Current physiological teaching, however, does not agree that respiration is the limiting factor; it considers rather that it is the cardiac output which limits the performance. However, in long sustained effort this may well not be true. It has been suggested, for example, that the performance of greyhounds can be improved by splitting the pericardium and so allowing an increased diastolic volume for the heart, thereby increasing cardiac performance and therefore muscular performance. Greyhounds, however, race over short courses. It has been indicated, also, that skeletal muscle will become fatigued in a healthy person before the heart can be induced to fail in exercise; though this does not preclude the fact that oxygen intake, related to maximal cardiac output, limits the skeletal muscle performance, and the heart does not fail.

A specially good performance of one system must, of course, be recognized. The heart of a racehorse has already been mentioned in this regard; likewise this horse was stated to have a wide trachea, which might allow greater intake of air for the same resistance and so at extreme limits of endurance have an effect in improving respiratory function. This factor is recognized in other fields. For example, the suggestion was made that the vocal cords and air sinuses of Melba were probably specially suited to the extreme range and delicate quality of her voice. A more remarkable voice in relation to range is now evident in South America, and this suggests special endowment.

The suggestion to increase performance with oxygen has been of particular interest lately. Some workers suggest that when a mixture of greater oxygen capacity than ordinary air is breathed, the oxygen intake is greater in patients with lung disorders than in those with heart disorders. Some workers doubt the veracity of these results. If they are true, this indicates that for maximum effort, when the cardio-vascular system is capable of much greater performance relatively than the respiratory system, oxygen breathing may be of value; but since the blood is completely oxygenated at a partial pressure of oxygen of about 100 millimetres of mercury for all ordinary rates of blood flow, such increased oxygen may not be of much value. With severe exertion the situation may differ.

The oxygen ultimately will aid in the removal of lactate, however, there is no close correlation between the blood lactate level and the maximum working capacity in normal individuals. At the same time, training does increase the ability to withstand high blood lactate levels.

In working on a treadmill to exhaustion, the working time to achieve this has been termed the performance

index. There was found to be no correlation between this figure and maximal heart rate, ventilation rate or respiratory rate. There was some degree of correlation with maximum oxygen consumption—that is, the heart performance again. It is also said that the rate of pulse recovery is unrelated to maximal work. In this regard it is important to realize that, while greater effort may cause a greater rise in pulse rate, a better heart may be able to have less increase in pulse rate for the same work; and this may be enhanced if respiration is more commodious with increase in the negative pressure in the thorax. For example, in work with different respirator containers in chemical respirators, the pulse rate rose higher with use of the lower resistance container, when more work was done at exhaustion. The lower pulse rate was associated with exhaustion with the higher resistance container. It may be possible to relate this to the respiratory efficiency of different individuals, for we had the same subject running or riding a bicycle with an enforced change of respiratory performance. The pulse rate may rise higher in the one because the heart can still beat efficiently under the different conditions with the more rapid pulse. On the other hand, the increased intrapleural negative pressure from the greater respiratory excursion with the higher resistance container may aid venous return and perhaps have a relation to a greater filling of the heart; though this latter concept seems unlikely. The systolic blood pressure fell to a level of 14 millimetres of mercury below the pre-exercise level half an hour after the exertion (to exhaustion), and the diastolic pressure fell also; this occurred to a greater extent in the group labouring with the greater resistance on respiration—namely, -13 millimetres compared with -5 millimetres of mercury. This fall may be due to release of adeny compounds in muscle with associated vasodilatation. In exercise not related to extreme endeavour many of these features may not be so significant.

The rate of the heart beat (pulse) rises with exercise. The rise in pulse rate with a given load is less in the trained individual than in the unfit. Nevertheless, the maximum pulse rate for exhausting work is approximately 196 beats per minute in either the trained or the unfit. Thus the trained individual is capable of more work at exhaustion, his pulse taking longer to achieve the limit. What determines this difference is not entirely clear. Increased vagal tone is one element keeping the pulse rate reduced in the trained individual; likewise the capacity to have a greater output per beat will allow a greater cardiac output, a greater oxygen consumption and thus a greater performance. For example, if the trained athlete has a resting pulse of, say, 48 beats per minute, which in effect is the resting pulse of the world mile record holder, the increased pulse rate (if the cardiac action remains efficient) yields an increase in cardiac output of 196 — or a little over four times. If the output per beat

can rise from 60 millilitres to 180 millilitres per beat, at the same time the increase in cardiac output is increased eleven times; but in such a case the individual concerned would have a greater output per beat basally yielding a maximum performance of about 35 litres per minute, the resting cardiac output being about four to six litres per minute. If the heart cannot beat efficiently at the rapid heart rate—that is, if the output per beat falls off—then naturally the performance will be impaired. Most world-renowned long distance runners (for example, Hägg of Sweden) and many others have a resting pulse rate per minute in the 40's. It would appear that this feature is an asset for such individuals; and while we may not be able to blueprint a distance athlete from his physiological measurements, this one feature, like our knowledge that heredity plays a part in hypertension, appears to be one of the few certain valuable attributes of which we are aware. There are outstanding exceptions. I believe that Zatopek is one. He is undoubtedly one of the greatest athletes of the day; and not only in this regard, but I believe, also in others, he confounds the

<sup>1</sup> The oxygen consumption of the present mile record holder is 76.6 millilitres per kilogram per minute during the latter stages of running at 20 kilometres per hour, which is 30% greater than that of physically trained students, according to a report in *Nature*, November 12, 1955.

experts in the brilliance of his performance in relation to style. Many other factors are probably important—for example, the part of the foot from which purchase is taken; toe running, for example, may tire the *tibialis anterior*, and so on.

The rapidity with which the pulse rate returns to normal after exercise is taken as an index of physical fitness, though some physiologists doubt the extreme value of this. The Harvard physical fitness index is the duration of the exercise (stepping on to a stool at a certain rate) in seconds multiplied by 100 and divided by twice the sum of the pulse counts one to one and a half, two to two and a half, and three to three and a half minutes after cessation of the exercise. It is significant that emotion may produce an increase in pulse rate greater than that produced in all but very strenuous exercise. Incidentally, the pulse rise in emotion is found to be the same in tame as in untamed animals.

The velocity of blood flow is also greatly increased in exercise, so much so that bruits may be produced in healthy people thereby.

If  $\frac{RV^2}{D}$  be greater than the critical constant for turbulence in a tube, then turbulence (and a bruit) is produced where  $v$  = viscosity of the blood,  $R$  = radius of the tube,  $D$  = density of the blood, and  $V$  = velocity of the blood. "V" then, if sufficiently great, produces turbulence, and a bruit may be heard over vessels and in the heart. Likewise, if "v" is reduced (as in anaemia), cardiac bruits may appear for the same reason. During exercise and in association with the elevated metabolism of thyrotoxicosis the increased velocity of blood-flow may produce a murmur. This is, of course, the same principle as that concerned in the rapid velocity produced when blood passes through irregular orifices and turbulence is likewise produced. The bruit of mitral stenosis and the bruit produced when pressure is made over a vessel with the stethoscope are similar. One of the loudest systolic bruits I have heard was over the apex in a rather athletic young man who was skipping to exhaustion. Turbulence also aids the transfer of oxygen from the plasma to the surface of the red cell and *vice versa*.

The coronary circulation is likewise affected by exercise, and indeed the coronary flow depends to a great deal, in health, on the pressure in the aorta. If the vagi are intact, a considerable rise occurs in the coronary flow—for example, in the dog from 95 to 160 millilitres per minute when the dog is walking on a treadmill and to 180 millilitres per minute when the treadmill was elevated. Evidently exercise works largely in its influence on the coronary flow in inhibiting vagal tone. There is, too, an output of adrenaline in exercise, which probably enhances this effect. In the totally denervated heart little effect is produced on the coronary flow by exercise. Increase of blood pressure does produce a reflex diminution of coronary flow through the carotid sinus reflex (and probably the vagus), although normally the increase in coronary flow is associated with raised blood pressure and pulse rate. More recently some evidence has been adduced that, notwithstanding heredity and dietetic influence, exercise, within limits, improves the health of the heart in relation to the coronary vessels; and it is suggested that sedentary occupations themselves may contribute partly to the extreme prevalence of coronary heart disease in high pressure executives and others. However, it must not be overlooked that probably much of what goes to make up the high pressure executive as a successful business man may itself be related to what produces the coronary effects. Endocrine activity has also been implicated in a protective role for coronary health.

The level of blood pressure which rises from 80 millimetres of mercury at one month of age to about 120 millimetres of mercury, systolic, in a young adult is also influenced temporarily by exercise. The blood pressure of one world record holder is 124 millimetres of mercury, systolic, and 74 millimetres, diastolic, at rest. This means

that the pulse pressure is 50 millimetres of mercury, a high normal, and to be expected with his slow basal pulse rate of 48 beats per minute. This gives him a correct cardiac output for basal needs, the body requiring 38 Calories per square metre of body surface per hour for metabolism; and if the mixed venous blood runs at a saturation of about 70% (14 millilitres of oxygen per 100 millilitres), the oxygen is supplied at the basal rate by these levels. Gale's formula includes this feature where pulse rate *plus* pulse pressure *minus* 111 equals basal metabolic rate. Thus with a reduced pulse rate the pulse pressure is normally relatively increased.

In emotional states, excitement and worry the blood pressure is raised, the systolic more than the diastolic. Adrenaline increases the pulse pressure particularly, and it is released in exercise. Nor-adrenaline, on the other hand, does not raise the pulse pressure so much, the diastolic pressure rising more and the systolic pressure rising less. The cardiac output is increased, and arteriolar constriction occurs with excitement; whereas restful sleep is associated with a reduction of systolic pressure of 10 to 30 millimetres of mercury. In exercise the systolic particularly and also the diastolic pressure rise, and they react in a similar fashion to excitement. The maximum increase is proportional to the amount of exercise (and its rate) that is undertaken.

The systolic pressure after exhausting exercise falls to levels even lower than the pre-exercise level, and the diastolic pressure also falls. This may be due to release of adenyly compounds from muscle, and naturally performance at this stage for muscular activity is reduced. The increase in pulse rate occurring with exercise is reduced more rapidly if the legs are banded during the recovery period. Presumably this reduces the amount of blood in the muscles, where it may be pooled to a degree associated with the vasodilatation. However, it is not suggested that this manoeuvre is required in athletic training.

The respiratory effects of exercise are rather considerable. The pulmonary ventilation may rise in severe muscular exercise to as much as 120 litres per minute and even more in top-line athletes. No single stimulus, chemical or nervous, will do that. It is considered that many types of stimuli are involved and that they must summate. The relative contributions of these various stimuli are not yet accurately evaluated. The proportions of them probably vary with the degree of exertion. The numerous probable stimuli may now be considered *seriatim*. Increase in carbon dioxide level in the arterial blood can apply only with mild exercise; for as the exercise assumes any proportion, the level of carbon dioxide in the alveolar air and likewise in the arterial blood falls. Rise of body temperature will account for some of the increase in respiratory rate. The level of lactic acid rises in the blood, but this cannot account for much increase; for example, the rise in respiration from carbon dioxide stimulation, the most powerful acid stimulant, reaches a maximum only of 60 litres per minute (at 9% carbon dioxide) and then falls off at high levels from anaesthetic effects. Recent work, however, is not entirely in agreement with this statement. Secretion of adrenaline may play a part. There are increased impulses also from the cerebral cortex, the joints and especially the muscles themselves, which greatly increase the respiratory rate. Increase in impulses from the chemoreceptors are probably minor in degree; though some from the lung and right atrium may be more operative. Undoubtedly the ability of the respiratory system to cope with the body's requirements is of considerable importance in strenuous athletic exercise. Mention has already been made in this regard in relation to cyclists and rowers. Further, athletes themselves, in distance running from a mile upwards, note subjectively respiratory symptoms as the most obtruding. Of course cardiac patients also usually complain of respiratory symptoms before they complain of other symptoms. However, in healthy subjects central venous pressure does not rise with exertion as it does in cardiac patients. The early cardiac patient may show this rise only on exertion, though it is usually present

when he is at rest. In cardiac patients respiratory symptoms occur with slight exertion, presumably because of sensitization of the Hering-Breuer reflex from slight pulmonary oedema, producing reduced modulus of elasticity and causing increased discharge of afferents for the same pulmonary excursion. Once it was thought that dilatation of pulmonary capillaries in cardiac conditions produced reflex respiratory stimulation, though this is now denied. Some impulses may come from the heart muscle itself. Perhaps the relation between respiratory function and cardiac is that the body depends on the pulmonary ventilation to allow intake of oxygen to supply the material for dealing with lactic acid. The circulation then limits the delivery of oxygen. Presumably severe exercise places such a strain on the ability of the skeletal muscles to deal with metabolites that it is not usually possible to strain the heart; though the dealing with metabolites is to quite an extent limited by the ability to supply oxygen. Nevertheless, death has occurred in very severe exertion, for example, the epic ride of Black Bess to York resulted in sudden death, as did the run of a Greek "marathon" messenger.

There is a slight rise in hydrogen ion concentration in the blood during mild exercise. At four miles per hour the alveolar carbon dioxide level rises from 42.5 to 45.5 millimetres of mercury and the pulmonary ventilation from 7.5 to 37.5 litres per minute. At five miles per hour the alveolar carbon dioxide level falls, and the ventilation rises further to 61 litres per minute. Further exertion is associated with a continued reduction in alveolar carbon dioxide level, although more carbon dioxide is produced. Under great exertion lactic acid accumulates, insufficient oxygen is available, and blood acidity rises. The respiratory rate and chemoreceptors may then be stimulated. Body temperature rises, even to 102° F. or more; and this also adds to the effect, as does adrenaline liberated into the blood-stream. The nervous impulses already referred to play a major part. Muscle liberates a chemical stimulant.

Muscular effects also require special consideration. Great effort is used up in the activity not only of the prime movers, but also of the fixators, antagonists and synergists. Activity may even spread also to muscle groups apparently not being used, though in most athletic endeavours practically all muscles are exerted to some degree. With fatigue newly acquired habits are affected more readily than older; for example, reversion from the "ball grip" to the "cylinder grip" may occur with fatigue. This itself may play a part in reducing athletic prowess under fatigue. After exhausting muscular work the muscles may become hypersensitive—that is, go into contraction more readily than properly rested muscle. Adrenaline and sympathetic stimulation may improve performance of fatigued muscle, perhaps by affecting blood supply. In fatigue of muscle the nerve is less fatigued, the muscle intermediate and the transmission from nerve to muscle most affected. If the frequency of stimulation is slow (less than 30 per second), progressive fall in mechanical response is due to contraction fatigue and not to transmission fatigue. Changes in viscosity and increase in osmotic pressure in muscle from reduced molecular size of metabolic materials both affect the performance of repeatedly contracting muscle. While the supply of oxygen, as mentioned, is the factor limiting performance, the onset of fatigue is due to failure of the contractile mechanism.

During maintained muscular effort when the effort required is not maximal (for example, in the early stage of the running of a marathon), there is a progressive increase in activity of the muscles—that is, more contraction to produce the same output. Heat production to the calorific value of the work is about 4:1—that is, like a petrol engine. In severe muscular exertion the heat production may be increased ten times. The trained athlete performs a little more efficiently than the untrained, and this may in part be due to lack of waste in muscular effort applied to the task in hand—for example, time of thrust and part of foot thrusting in a particular distance race. As muscular work progresses, associated with recruitment of other muscles, the activity may cease to be smooth. In distance running a warm-up period is applied prior to

running which will improve blood supply to muscles, so that at the outset efficiency may be greater; but after prolonged muscular exertion the period of each contraction becomes prolonged, so that one phase runs into the next, and the muscle is unable to relax completely.

As an aftermath of the exertion, temporary swelling of muscles develops due to the increased amount of fluid associated with accumulation of metabolites already referred to. Soreness is said to be due to increased pressure affecting pain endings in the muscle. The oedema also probably reduces blood-flow through the muscles. It has been suggested that continuous working in this way may lead to the deposition of fibrous tissue and so interfere with the normal contraction and account for "over-trained" muscles, though I doubt this. It is to be remembered that in youth muscles are relatively more wet and lean in association with pituitary activity, and that as age increases the muscle becomes more fatty and dry. This will limit performance with age; but of course many of the marathon-runners in the past produced their best times in their late thirties and even in their forties, a fact said to be due to better circulatory adjustment. Soreness lasting for days in muscle is usually attributed to microscopical injuries within the muscle. The time for recovery is in line with this viewpoint. Pain (myalgia) is sometimes due to localized contractions within the muscle. The muscle then may contract spontaneously, producing cramp. Muscle when exercised develops pain-producing substance in the metabolites, and this is removed by the vascular system. If the circulation is impaired, this substance is removed more gradually. This substance has variously been reported as potassium, tyramine derivative, histamine and tryptamine. Soreness may then recur more readily after a short period of rest when exercise is undertaken. Practice undoubtedly can affect the length of time a person can maintain a given muscular performance. One of the best examples in more popular literature is that of Ben Hur, who became a galley slave. Endurance is increased by allowing the muscles to act to their best advantage. Muscles engaged in repeated powerful movements (heart, leg and back muscles) contain an amount of muscle haemoglobin which combines more rapidly with oxygen and have a larger supply of oxygen and "fuel". The oxygen may be unloaded at only five millimetres of mercury pressure and saturate the haemoglobin at 40 millimetres of mercury (that is, the venous blood level). Cells remote from a capillary are then able to cope with the situation of ischaemia during contraction. Of course there is a very great density of capillaries to cardiac muscle fibres. Rapidly moving muscle, as in the hearts of small animals, is paler and contains a preponderance of enzyme systems concerned with activation of molecular oxygen.

At the beginning of muscular exertion time is required for the adjustment of the circulation and respiration to meet the increased oxygen demand. Therefore there is an initial period of relative oxygen deficiency, during which the blood lactic acid level rises. This period can be overcome in the warming-up process. Later, with levelling off of exercise, when adequate oxygen is supplied, the blood lactate level may be unchanged or even fall. Lactic acid is apparently not obtrusive after adequate oxygen is supplied. After exercise there is oxidative recovery associated with removal of lactate and refilling of energy stores. The amount of oxidative recovery after exercise is related to the severity of the exercise. With severe exertion requiring rates of expenditure of energy vastly in excess of any possible rate of oxygen supply, practically all the oxygen used is used in the recovery period. This ability of muscle to accumulate an oxygen debt is useful. Most of the energy required for rhythmic moderate activity is obtained from the concurrent oxygen obtained.

Renal effects are also noteworthy in exercise. There is diminution in glomerular filtration rate and plasma flow. In light exercise 150 millilitres of whole blood per minute are diverted from the kidney (normally one litre per minute) for the circulation elsewhere. With heavy work 330 millilitres are diverted, and the return to normal does not occur even within forty minutes of cessation of the

exercise. The increased blood presumably goes to the muscles. The renal vascular resistance increases five times. Urine, normally free of protein before exercise, may, in a healthy person, contain protein in the first and second post-exercise periods of twenty minutes each and disappear by the third twenty-minute period. It is suggested that many glomeruli may, during exercise, have no blood flow. Similar ischaemic effects may be produced by adrenaline and anoxia, and may be counteracted by certain ergotamine derivatives. The light renal vasoconstriction seen in moderate exercise is apparently due to nervous impulses. The constricting action of adrenaline is evidently added as the exercise becomes more severe. Renal vasoconstriction is considerable with maximal exercise. However, the paraamino-hippuric acid plasma clearance is not the real plasma flow estimated with exercise because of the shunting of blood not cleared.

Temperature regulation is also affected in exercise. Temperature rise is different in different parts, the rise in rectal temperature being greater than that in the leg. It is said that there is an altered setting of the heat-dissipating centre when one compares work with the arms in the one case and with legs in another (for example, in cyclists). An increase in metabolic rate accompanies this increase. The strain of work in hot environments can be relieved only when sufficient heat can be secreted over the body surface by increasing the number of potentially active sweat glands. I remember the world mile record holder making an attempt on the four-minute mile at the Amateur Sports Ground when the air temperature was 100° F., and he felt certain that he could not break it then; he ran the mile in four minutes 17 seconds.

The efficiency of the nervous system, a rather vague term (for example, reaction time at starting), and psychological effects are undoubtedly most important in the performance of great athletic prowess. The enthusiasm of crowds in Czechoslovakia, quite evident in films, probably helped Zatopek to record his magnificent performances. The track at Turku has probably a very good resilient surface, but the help of Chataway was undoubtedly important in helping Landy beat the world mile record. Generalship in running, the opposition field and the ballyhoo of publicity all probably play their part in one way or another. The ability to concentrate and the effect of alertness which may fall for various reasons, including fatigue and possibly staleness, with their recognized changes in cerebral electrical activity, are also extremely important.

It is thus quite evident that the physiologic factors involved in athletic endeavour are multitudinous; and if we are to increase athletic performance it may well be that an empirical approach will pay dividends more quickly. Empiricism is often a good approach to a complicated subject, and the varying of one factor, say A, on the ultimate performance, P, is not an illogical way in which to tackle the problem, even if it takes us a good many years to know precisely why the performance is so bettered.

#### THE TREATMENT OF SHOCK-DEPENDENCY BY PHARMACOLOGICAL AGENTS.

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SHOCK-DEPENDENCY (Bourne, 1954) is that condition in which a psychotic patient responds well to electroconvulsive or "Cardiazol" shock therapy, but requires frequent repetition of the treatment to maintain his improvement. Even if shock treatment is necessary only at intervals of several months, it interferes with the work

capacity of the patient, because of the temporary amnesia or confusion that follows. Furthermore, the period of optimal improvement is only too often clouded by an overwhelming fear of the treatment and by a hopelessness of outlook. If shock treatment has to be administered at intervals of one or two weeks, the optimal improvement lasts rarely more than a few days, and the patients almost always require hospital care. The present paper reports attempts to prolong the period of optimal improvement after shock treatment by the use of pharmacological agents.

Initially, sedatives were used in cases in which the relapse proceeded towards over-activity, and stimulants in cases in which it proceeded towards stupor; but it was soon found that most patients required a combination of drugs.

#### Reports of Cases.

All patients requiring regular shock treatment, without exception, were submitted to pharmacological treatment. Since the aim of the treatment was merely to maintain the optimum mental improvement effected by shock therapy, it is preferred not to use the term "cured". The term "relieved" is used if the intervals between necessary shock treatments could be significantly prolonged (at least three or four times); the term "improved" is used if a satisfactory mental condition could be maintained without further shock treatment; and the term "fully improved" is used if the patient could, on oral medication alone, be returned to his previous work, or to other work of about equal responsibility. The cases recorded refer to patients in hospital; the number of out-patients treated for shock-dependency was limited, but they responded as well to pharmacological therapy as did the more seriously affected in-patients. Figure I illustrates the therapeutic progress in six cases not detailed in the case histories. The number of patients treated and the results observed were as shown in Table I.

The actual procedure will be described in a few clinical histories.

CASE I.—Mr. A, aged twenty-five years, was admitted to hospital in January, 1952; he was diagnosed as a borderline defective suffering from catatonic schizophrenia. He was apathetic and listless, and suffered from auditory hallucinations. After a course of full coma insulin therapy he was released in March, 1952, and readmitted a fortnight later. During the following years he became progressively more immobile and mute, and was frequently incontinent of urine and faeces; he received electroconvulsive therapy weekly to fortnightly in an attempt to keep him clean and at a level which would enable him, at least partially, to remain in contact with his surroundings. In July, 1954, when he was started on sodium succinate treatment, six tablets by mouth three times a day, his was not considered to be a promising case. However, by October he had shown considerable improvement, was completely continent and able to look after himself, and interested in some occupational activities. In November, 1955, he was still slightly apathetic, but he talked, and his answers to simple questions were relevant and rational. He was fully and regularly occupied in the hospital garden and participated in social activities. He had had no electroconvulsive therapy since October, 1954, was free from hallucinations or other psychotic symptoms, and was probably in his optimal mental condition.

CASE II.—Mr. B, aged thirty-six years, a mechanical engineer, had been first admitted to hospital in October, 1952, with the diagnosis of paranoid schizophrenia. He did not respond to full coma insulin therapy, and electroconvulsive therapy effected only transient improvement. He became progressively more uncommunicative, sullen and withdrawn. In May, 1954, when sodium succinate therapy was begun (six tablets three times a day by mouth), he suffered from delusions, hallucinations and ideas of reference, and required weekly electroconvulsive treatments to prevent him from becoming completely stuporose. He responded to oral succinate therapy in so far as the intervals between necessary shock treatments became prolonged to two or three weeks. In July, 1954, intravenous succinate-barbiturate treatment was commenced and continued at a rate of five treatments per week to a total of 40 injections. During this course he began to take an interest in painting and in reproducing technical drawings. By September, 1954, he was free from psychotic symptoms, mentally bright and cheerful in outlook. In October he was released from hospital taking sodium succinate by mouth

(four tablets three times a day). He has not required any electroconvulsive therapy since August, 1954, has maintained his improvement and is working full time in an engineer's shop.

**CASE III.**—Mr. C, aged forty-one years, a labourer, had been first admitted to hospital in September, 1949, with ideas of grandeur, delusions and hallucinations. He was diagnosed as suffering from paranoid schizophrenia. He did not respond to full coma insulin therapy. Six months later he had become violent, destructive and unmanageable, possibly owing to hallucinations, confusion and disorientation; he required weekly electroconvulsive therapy. In March, 1954, he was started on lithium citrate, 30 grains three times a day, which reduced his aggressive tendencies, but failed to affect his confusion and his hallucinations. In April, 1954, he was given barbiturate-succinate injections in addition to lithium by mouth, and received a total of 35 injections. When presented to a clinical meeting in June, 1954, he was found to be mentally clear with insight into his past illness, free from delusions and hallucinations, well behaved and able to discuss his future plans. He was released shortly afterwards, and is employed in a clerical job for which he had to pass an entrance examination. He is still taking lithium carbonate, one tablet three times a day, with sodium succinate, three tablets three times a day, and has not required any electroconvulsive therapy since May, 1954.

**CASE IV.**—Mr. D., aged forty-four years, a professional man with high qualifications, was admitted to hospital in December, 1945, manifesting increased psychomotor activity, impulsiveness, flight of ideas, emotional instability, sleeplessness and signs suggestive of personality disintegration. He responded only slightly to a first course of electroconvulsive therapy, but after repeated treatments and heavy sedation he was released in April, 1947. Six months later he was re-admitted to hospital in an acutely manic state and treated with electroconvulsive therapy; he was released again after four months and readmitted after a further six months. This sequence continued up till 1954, the manic phase becoming every time more acute in onset. Although there were no symptoms of psychotic depression during the intervals, the patient felt hopeless and was not capable of following his profession. In March, 1954, treatment was commenced with lithium citrate, 30 grains three times a day (without electroconvulsive therapy). After three weeks he was quiet and rational, and slept without sedation. In May, 1954, he was released from hospital taking three to four tablets of lithium carbonate per day. He is fully active in his previous profession, but he is examined every three or four weeks, since it appears that the lithium maintenance dose does not fully prevent recurrent manic phases. But the onset is less acute, in so far as the patient himself becomes aware of increased talkativeness and psychomotor activity. Such episodes occurred in January and August, 1955, and were dealt with by doubling the dose of lithium for ten days.

**CASE V.**—Mr. E, a pensioner, aged twenty-nine years, has spent most of his life in an epileptic colony. His grand mal attacks were treated with "Dilantin" and phenobarbital, with only moderate success. He became progressively more quarrelsome, aggressive and destructive. In February, 1954,

he had to be removed from the colony. He was at home for a few days, but when he attacked his parents and smashed crockery and furniture, he was admitted to a mental hospital. He responded well to electroconvulsive therapy, but the improvement lasted only a few days, and he was so unstable that he had to be kept in a closed room. In April, 1954, treatment was commenced with lithium citrate, 30 grains three times a day, and within a fortnight he became quieter and was more readily manageable. A few weeks later he was cooperative and helped in simple ward tasks. He is now in an open ward and works in the hospital gardens. He is still on the same lithium dosage and his previous anti-convulsants, and has maintained his improvement without further need of electroconvulsive therapy.

**CASE VI.**—Mr. F, aged seventeen years, a labourer, has a long history of juvenile delinquency and was first committed to a boys' home at the age of nine years. He has had little or no schooling. He was admitted to a mental hospital in August, 1954, with a police record of shop-lifting, car stealing, breaking and entering, and homicidal

attacks. In the hospital he was completely unmanageable; electroconvulsive therapy quietened him for a few days only. In October, 1954, treatment was commenced with lithium, 30 grains of the citrate three times a day, with the result that he could be transferred to an open ward within six weeks. Maintained on the same dosage, he has since shown further symptomatic improvement. He is now quiet and respectful, and works in the ward and does odd jobs around the hospital. He requires neither electroconvulsive therapy nor additional sedation; but it will be difficult to release him because of his educational backwardness, and because it is uncertain whether he would continue with regular medication.

#### Comments on Therapeutic Agents and Therapy.

##### Lithium.

The absorption and excretion of the lithium ion in man and its toxicity have been investigated by Trautner *et alii* (1955). It appears that on prolonged daily ingestion of up to 15 grains of the carbonate (or twice that amount of the citrate) no side effects need be feared; higher doses require weekly, and later on in the treatment, monthly controls of the plasma lithium level. This should amount to 2% to 2.5% of the daily dose per litre of plasma. Thus, with the usual daily dose of six tablets of five grains of the carbonate, 43 milliequivalents of lithium, the plasma level should remain between 0.8 and 1.0 milliequivalent per litre; or, with the higher dose of nine tablets per day, at between 1.3 and 1.5 milliequivalents per litre. In any case, when the plasma levels were found either to rise significantly above these values, or to remain well below them, it was found preferable to interrupt the therapy rather than to risk possibly dangerous complications. Details of the therapy are given by Schou (1954), by Glesinger (1954) and by others. Its effect on the duration of the improvement induced by shock treatment was noted by Plichet (1954). The drug exercises sedative effects without any narcotic or hypnotic action. An occasional side effect was mild diuresis. Prolonged treatment did not

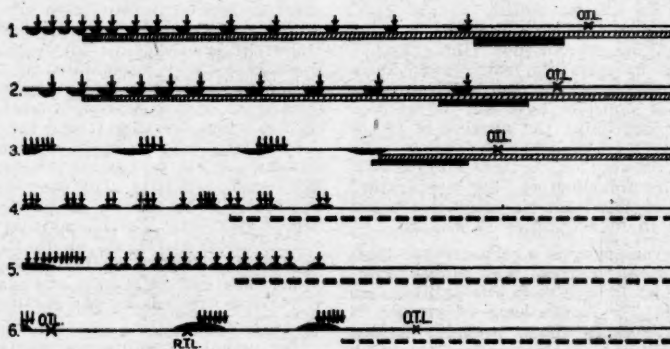


FIGURE 1.

Therapeutic progress during treatment of shock dependency. Upper line: mental condition; black segments above line indicate psychotic over-activity, below line, psychotic depression; arrows—single electroconvulsive treatments. Lower line: therapy; shaded line, oral succinate therapy; black blocks, intravenous succinate-barbiturate therapy; interrupted line, oral administration of lithium salts. "OTL", released from hospital on trial leave; "RTL", returned to hospital. Clinical diagnoses: 1, chronic stuporous schizophrenia of three years' duration; release from hospital in December, 1954. 2, Chronic stuporous schizophrenia, patient in hospital since 1951, released in November, 1954. 3, Catatonic mute schizophrenia of six years' duration; release from hospital in October, 1954. 4, Destructive-unmanageable schizophrenia of twenty years' duration; patient could not be released, but required no electroconvulsive therapy after August, 1953. 5, Overactive-destructive schizophrenia of sixteen years' duration; patient could not be released, but required no electroconvulsive therapy after August, 1953. 6, Grave mania of two years' duration recurrent at three months' intervals; patient released in June, 1953. The patient had no further attacks of mania and has not required any electroconvulsive therapy since his release.

appear to cause depression in monophasic manic patients or to precipitate its onset in cyclic patients. The psychomotor excitement of schizophrenic patients was easily controlled, and, in some patients at least, purely mental restlessness, such as garrulity or argumentativeness, was distinctly relieved. However, hallucinations, as well as persistent preoccupations or paranoid thought trends, remained unaffected. Lithium can be used as the bromide; it can safely and with benefit be combined with the usual doses of barbiturates, paraldehyde, *et cetera*; but it has been observed that when it is combined over prolonged periods with some other psychiatric drugs (such as "Largactil" or reserpine), toxic symptoms may be provoked on doses of lithium which are otherwise well tolerated.

TABLE I.  
Results in 133 Cases.

Result.	Schizophrenia. (97 Patients.)	Phasic Psychoses. (10 Patients.)	Other Conditions. (26 Patients.)	Total (133).
Unchanged ..	0	1	1	2
Believed ..	6	1	3	10
Improved ..	61	8	16	85
Fully improved ..	30	0	6	36

#### Sodium Succinate.

After an initial cough reflex, the intravenous injection of sodium succinate causes a deep flush of the facial area, followed later on by an increase in the depth of respiration and a rise in blood pressure (Trautner *et alii*, 1954). A statistically significant drop in circulating eosinophilic cells, of the pattern observed after administration of adrenaline or ACTH is seen in the healthy subject as well as in the patient (Trethewie *et alii*, in the press). The oral or intravenous administration of succinate only rarely produced any psychological changes in the healthy. We never noticed any in ourselves, and only two of about 30 volunteers stated that they felt slightly more restless or irritable. In experimental mescaline hallucinations of the healthy, succinate was found to be the only one of a series of glucose metabolites which, on intravenous injection, completely abolished the hallucinations for a period of about forty-five minutes (Schueler, 1948). However, in psychotic patients some immediate psychological responses were observed. On prolonged slow drip infusion of sodium succinate it was occasionally seen that depressed patients became cheerful and amenable, that mute catatonic patients began to talk and that hallucinated patients lost their hallucinations so that finally "they could no longer be heard". The improvement lasted from eight to eighteen hours. These occasional dramatic effects of succinate have been confirmed by Arnold and Hofmann (1955).

Sodium succinate was preferred to caffeine, "Methedrine", nicotinic acid and other stimulants proposed for the treatment of mental conditions, because (a) there was never any initial feeling of anxiety or apprehension, tachycardia or other unpleasant sensations, (b) even high doses did not produce late undesirable effects like restlessness, excitement or insomnia, and (c) no habituation was ever observed. In over 3000 injections a few patients complained of slight gastric discomfort and a few showed transient increased diuresis. More or less pronounced tremors of hand, forearm and sometimes leg muscles were occasionally observed in tense patients, but they appeared to be symptoms of the release of tension rather than toxic effects of the drug. Succinate did not affect restlessness or psychomotor excitement, or paranoid and related preoccupations, even if these patients became distinctly more accessible.

Some patients responded well on oral succinate therapy alone. In the majority of cases the more efficient intravenous route was used. The procedure usually followed was as follows. The patient was started on oral succinate therapy, two tablets of 0.5 gramme each being taken three times a day, and the dose being increased within one week to six tablets three times a day; then intravenous treatment was commenced, 30 to 75 millilitres of a 5% solution

buffered to pH 6.5 (D. Bull Laboratories, Melbourne) being slowly injected into the cubital vein, to a total of 30 to 40 injections at the rate of five to six injections per week. Some patients responded more quickly to slow intravenous drip infusion of 200 to 350 millilitres of a 10% solution over a period of one and a half to two hours at the rate of 60 drops per minute. Usually not more than three or four drip infusions were given on alternate days at the beginning of the course. The oral medication was continued throughout the intravenous treatment and maintained afterwards.

#### Barbiturates.

Barbiturate treatment alone did not affect the condition of shock dependency. However, some patients responded to a combination of barbiturates with other drugs even if neither drug alone was of benefit. Zeleva (1953) and other Russian workers used barbiturates combined with stimulants or analeptics for the treatment of psychotic conditions. Margulies (1955) used barbiturates with salicylate and with lithium.

Whenever barbiturate narcosis was intended, the patient received one one-hundredth of a grain of atropine by hypodermic injection half an hour prior to barbiturate treatment. Usually 0.5 to 0.7 gramme of "Pentothal" was given intravenously, the amount being adjusted so that twenty to thirty minutes of sleep could be expected. Occasionally "Nembutal" was given by mouth in a quantity sufficient to cause one or two hours' sleep.

#### Combined Medication.

**Lithium and Succinate.**—In a series of cases lithium treatment controlled the psychomotor excitement, but the patient remained uninterested in his surroundings. The condition did not appear to be due to an excessive sedative effect of lithium and could not be influenced by adjusting the lithium dosage to the minimum required to control the over-activity. In many of these cases persistent, often hallucinatory preoccupations were noted. Six to 12 intravenous succinate treatments, followed by oral succinate therapy in addition to the lithium medication, often brought these patients to normal contact with their surroundings. Paranoid ideas were usually only reduced in subjective importance, but not completely removed.

**Succinate and Barbiturate.**—In previous publications (1954) we reported that, as a rule, pure depressive conditions responded to succinate alone, while schizophrenic conditions required intravenous succinate therapy combined with barbiturate narcosis. The observation was confirmed in the present work, particularly in cases in which, during the optimal improvement resulting from shock-treatment, more or less persistent withdrawal was present. The effect of the combined therapy varied with the procedure. If intravenous barbiturate therapy was given first, the patient usually woke up when succinate was injected and often remained awake; this confirms the observations of Barrett (1949). If intravenous succinate therapy was given first, the patient, instead of remaining awake as might have been expected, frequently slept for two or three hours after receiving an amount of barbiturate which, without succinate, caused only twenty to thirty minutes' sleep. It appeared that in these patients succinate, instead of having analeptic effects, caused a relaxation rather conducive to sleep. The effect on the mental condition also differed with the procedure of applying the drugs, but it was not always predictable. Combined succinate-barbiturate treatment was usually started in the second week of intravenous succinate treatment, the actual procedure being modified during the treatment according to the responses observed. At the start three to four succinate-barbiturate treatments were given per week; but, as the intervals between necessary convulsive treatments became longer, the barbiturate treatments were given at longer intervals and finally omitted altogether, while intravenous succinate therapy was continued and replaced by oral succinate therapy only when optimal improvement appeared to be stabilized. The number of succinate-barbiturate treatments required varied from 10 to 20. Once optimal improvement had been obtained, no barbiturate was required by mouth either as a sedative or as a hypnotic during the night.

### Maintenance of the Improvement.

In all cases oral medication with lithium and/or succinate was continued and only very slowly reduced. In only a few cases so far has it been able to be altogether omitted. It may be added that no adaptation to any of these drugs appeared to occur, and that in cases of relapse, usually due to discontinuation of the oral medication, the patients responded quickly to the treatment which previously had proved to be effective.

### Discussion.

Bourne (1954) suggested that shock-dependency may be found only in "true" psychoses. Our cases cover practically the complete range of mental diseases from phasic psychoses and schizophrenia to epileptic, post-alcoholic and other behaviour disorders. In some cases classified as psychopathic behaviour disorders, no clear psychotic symptoms could be detected during the time of observation, nor were any recorded in the case histories. In a few of these cases, the anamnesis prior to the first admission to hospital suggested a transient psychotic episode, usually of schizophrenic character; in others, the possibility of developmental damage to the brain through grave illness in early childhood (presenting the picture of "neurophrenia"—Doll, 1951) may have to be considered. We are at present not prepared to express an opinion as to whether the condition of shock-dependency is indicative of a "true" psychosis.

The common factor of the cases presented is the instability of the improvement. The dramatic effect of shock treatment on symptoms grave enough to be acutely incapacitating and a danger to life demonstrates the condition as not due to irreparable degeneration. It was therefore considered that the relapse might be due to a functional or metabolic disorder, which as such might be approached by treatment with pharmacological agents, stimulants or sedatives as the case might require. It is not claimed that the therapeutic procedures presented are the only ones which relieve shock-dependency. Rather, it is supposed that a number of related drugs, in suitable application and combination, will fulfil the same purpose. We confirmed this assumption in some trials. However, we were fully satisfied with the drugs mentioned, and since they are inexpensive, simple, and safe or easily controlled, we saw no reason to change to newer, more complex but less investigated drugs.

The cases in this series were individually and diagnostically too different to allow a statistical evaluation to be made except with respect to the interval between necessary shock treatments. The diagram (Figure 1) and the therapeutic results presented would suggest that the change is highly significant. However, it must be remembered that for some years most of these patients had not received any attention except occasional sedation and shock treatment. With the view to differentiating between psychological and pharmacological effects the following precautions were taken. The succinate and lithium tablets used were indistinguishable from barbiturate, calcium lactate, starch and other tablets used for the same patients or for other patients in the same ward under the same conditions. The patients were not informed about the nature or expected effect of oral and intravenous or combined treatment, and intravenous treatment was given in the ward where other patients received sleep therapy or other intravenous injections. No psychotherapy was attempted. However, once the patients realized that their improvement became more stable and that the necessity of further shock treatment became more remote, there was an indubitable and sometimes overwhelming psychological uplift. The recovery proceeded in some patients to a higher level of mental or professional performance than could be expected from their optimal level between shock treatments. The evidence available so far does not enable us to decide to what extent the final result is due to a curative effect of the drugs used or to what extent it is helped by the changed mental outlook. We observed only that the patients slowly relapsed to their previous condition of shock-dependency

when the medication was interrupted or replaced by innocuous drugs.

It would be premature to attempt a detailed discussion of the rationale of the therapy or of the mechanism by which the clinical benefit is achieved. The following two hypotheses present themselves without being mutually exclusive. (i) It is possible that the effect of electroconvulsive therapy is modified by the concomitant medication. A confirmation of this may be seen in the observations by R. H. Burrell (Tokanui Hospital, Te Awamutu, New Zealand—private communication) that oral succinate therapy plus electroconvulsive therapy was of significant benefit to patients who showed no response to either of these treatments alone. (ii) It is possible that the pharmacological agents prevent the "triggering" of the relapse—that is, that they counteract the first insidious manifestations of retardation or restlessness which, once established, lead through some sort of vicious circle to progressively graver and finally the gravest of symptoms. Confirmation of this interpretation may be seen in the necessity for adapting the medication to the trend of the relapse in the individual patient. Furthermore, a threatening relapse sometimes did not require renewed electroconvulsive therapy, but responded to intensification of the pharmacological treatment alone. Further investigation may give information about the specific mode and site of action of the drugs used, thus providing further data about the mechanism which leads to the relapse and possibly about that by which the illness was originally established and maintained.

### Summary.

1. A description is given of attempts to prolong or maintain by the use of pharmacological agents the temporary improvement resulting from shock therapy in shock-dependent psychotic or psychopathic conditions.
2. Lithium salts were used for patients relapsing towards over-activity, and sodium succinate for patients relapsing towards stupor. In many cases optimal benefit was obtained only by combining the two medications or by combining succinate with barbiturate narcosis.
3. Case histories are presented and details of the therapeutic procedure are given. The results are briefly discussed.

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## THE MORTALITY IN AUSTRALIA FROM DISEASES OF THE ALIMENTARY SYSTEM.

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THIS article continues the series on mortality in Australia by analysing the data set out in *Demography*, the annual bulletin of the Bureau of Census and Statistics, Canberra. The mortality from diseases of the alimentary system, other than the cancers and infections, is analysed.

### Definitions.

The diseases of the alimentary tract which are discussed here are those grouped into the class of "Diseases of the Digestive System", according to the rules laid down in the second to the fifth revisions of the *International List of Causes of Death*. The rubrics "diarrhea and enteritis", which have already been treated in this series, have been excepted (Lancaster, 1953). The class, and consequently this paper, includes neither the cancers nor any of the infective diseases such as typhoid, dysentery and tuberculosis, all of which have already been discussed in this series.

### Diseases of the Alimentary System.

In Table I are given the death rates from diseases of the alimentary system, as defined above, by age and sex. The table may be examined to find the shape of the mortality curve by age at a point of time, say for the years 1931 to 1940. The mortality is high in the first few years of life, and then falls to a minimum in the age group five to fourteen years. Above this age the rates rise steadily throughout life. The graph of the mortality rates has this same general form for either sex and for every period.

If attention is fixed upon any particular age group, then a considerable decline in the mortality is to be observed.

Thus for males of ages five to fourteen years the mortality rate has fallen from 188 per million per annum in the period 1908 to 1910 to 46 per million per annum in the latest period, 1946 to 1950. Declines, although not so pronounced, are to be noted for every other age group.

If the death rates of the two sexes are compared in any period, the male rates are usually higher than the female. This high masculinity has tended to become more pronounced in the more recent periods, because in general the rates have improved more for the females than for the males.

If the populations are considered as a whole, then the crude death rates may be compared. These are given in Table I, as the deaths at all ages in the final column. The male crude death rate has shown only a moderate decline, that for the female a more definite decline. But in both sexes these crude death rates are affected by the aging of the population.

To avoid this defect, the death rate at each age has been applied to each of three types of standard population, by a process already explained (Lancaster, 1950). These standardized death rates—that is, the deaths per million per annum to be expected in the standard population if it were submitted to the same schedule of mortality as held in the actual population—are given in Table II. The standardized rates for females have each fallen by the end of the most recent period to less than half the value in the earliest period. The improvement has been less pronounced for the males.

### The Masculinity of the Mortality from Diseases of the Alimentary System.

In Table III are set out the masculinities of the death rates. The masculinity is defined as one hundred times the male rate divided by the female rate at the same age. The masculinity in each case has been computed for the experience of the years 1931 to 1940. In some diseases there were insufficient deaths to give a good estimate of the masculinity, and the corresponding cells in Table III have been left empty. The group as a whole shows a high masculinity throughout life. Among individual diseases, ulcers of the stomach and duodenum have a high masculinity, especially at ages thirty-five to sixty-four years. The three age groups of this range have masculinities of 562, 574 and 425. Reference to Table V shows that this high male preponderance is a relatively new appearance, as it was not apparent before 1920. Since then the male rates have increased very rapidly, while the female rates have declined moderately. "Other diseases of the stomach" and appendicitis also have a high masculinity. There is a variable masculinity associated with hernia and intestinal obstruction. This is to be explained by the different types of hernia affecting the two sexes differently according to age. The male death rates are about double the female until the age of twenty-five years. Clinical experience would suggest that this is

TABLE I.  
*The Mortality in Australia from Diseases of the Alimentary System.*

Period.	Sex.	Deaths per Million per Annum at Ages (Years).									
		0 to 4.	5 to 14.	15 to 24.	25 to 34.	35 to 44.	45 to 54.	55 to 64.	65 to 74.	75 and Over.	All Ages.
1908 to 1910 .. ..	M.	430	188	195	239	423	792	1392	2751	3950	507
1911 to 1920 .. ..	M.	616	139	188	234	408	763	1265	2031	3692	494
1921 to 1930 .. ..	M.	438	112	187	214	389	737	1251	1831	3090	470
1931 to 1940 .. ..	M.	309	111	157	191	380	727	1187	1911	2930	477
1941 to 1945 .. ..	M.	290	108	(78) <sup>1</sup>	(106) <sup>1</sup>	(261) <sup>1</sup>	630	1176	1898	3141	461
1946 to 1950 .. ..	M.	201	46	55	87	207	556	1083	1739	3074	405
1908 to 1910 .. ..	F.	318	157	187	268	410	687	1298	2410	3819	443
1911 to 1920 .. ..	F.	455	154	156	240	381	616	1024	2013	3886	431
1921 to 1930 .. ..	F.	327	121	112	190	314	544	898	1607	3122	378
1931 to 1940 .. ..	F.	231	96	92	146	243	450	764	1336	2794	345
1941 to 1945 .. ..	F.	159	80	78	106	194	354	629	1145	2554	314
1946 to 1950 .. ..	F.	142	48	47	75	147	319	592	1031	2101	276

<sup>1</sup> Affected by wartime security measures and statistical practices.

due to the greater incidence of inguinal hernia in the male, in whom congenital weakness is made evident in the early years of muscular exertion. Over the ages twenty-five to fifty-five years the masculinity is low. This is due to the higher incidence of umbilical and femoral hernia in the female, the condition perhaps being aggravated by changes in weight and by pregnancy. After the age of fifty-five years the masculinity is again high.

TABLE II.

The Crude and Standardized Mortality Rates from Diseases of the Alimentary System.

Period.	Sex.	Deaths per Million per Annum.			
		Crude Death Rate.	As Standardized on to the Enumerated Population of England and Wales, 1901.	As Standardized on to the Life Table Population Derived from the Australian Census of 1933.	As an Equivalent Average Death Rate for Persons of Ages Under 65 Years.
1908 to 1910	M.	507	500	812	531
1911 to 1920	M.	494	472	730	508
1921 to 1930	M.	470	423	662	478
1931 to 1940	M.	477	393	635	447
1941 to 1945	M.	451	339	587	385
1946 to 1950	M.	406	284	523	328
1908 to 1910	F.	443	485	824	487
1911 to 1920	F.	431	448	751	430
1921 to 1930	F.	378	362	613	360
1931 to 1940	F.	345	295	515	293
1941 to 1945	F.	314	241	436	234
1946 to 1950	F.	276	199	371	200

The low masculinities for deaths from biliary calculi and from "other diseases of the liver" are what might be expected from clinical experience.

I shall now review briefly the mortality from the principal individual diseases in this group. A full consideration of the epidemiological and clinical aspects would take

us away from the primary purpose of my series, which is to give a comprehensive picture of the changes in mortality in Australia.

#### The Mortality from Appendicitis and Typhlitis.

The death rates from appendicitis, or typhlitis as this disease was once termed, are set out in Table IV. For a given period, say 1931 to 1940, the rates are relatively low at ages under five years and then tend to increase throughout childhood and adult life. For any age group there have been great declines, especially at the younger ages. However, these declines are not very definite in the males until 1940. Even so, it may be questioned whether the falls were not accentuated by wartime statistical practices. However, there is certainly a decline in the most recent period. There had been decreases in the female rates before 1940, but these decreases have been especially pronounced in the two more recent periods.

#### Ulcers of the Stomach and Duodenum.

In the vital statistics it is difficult to separate out mortality due to duodenal ulcer from that due to gastric ulcer, so that we are here really considering peptic ulceration. There appear to have been considerable increases in the male mortality above the age of thirty-five years. The increases between the periods 1911 to 1920 and 1921 to 1930 may have been due to changes in the *International List*, especially transfers from the rubric "other diseases of the stomach". But since then the rates for the females have tended to decline, whereas there have been definite increases in the male rates. It may be suggested that these more recent changes are also due to a transfer of deaths from the rubric "other diseases of the stomach", but the rates for that rubric have fallen equally in the two sexes. It seems fair to regard as real the increase in mortality from ulcers of the stomach and duodenum in males.

#### Hernia and Intestinal Obstruction.

The death rates from hernia and intestinal obstruction are given in Table VI. We have already noted some features of the age distribution of these diseases. The

TABLE III.

The Masculinity of the Mortality Rates in the Period 1931 to 1940.

Site.	0 to 4 Years.	5 to 14 Years.	15 to 24 Years.	25 to 34 Years.	35 to 44 Years.	45 to 54 Years.	55 to 64 Years.	65 to 74 Years.	75 Years and Over.	All Ages.
Alimentary system .. .. .	134	116	171	131	156	162	155	143	105	138
Ulcers of the stomach and duodenum .. .. .	+ <sup>1</sup>	+	+	+	562	574	425	308	238	383
Other diseases of the stomach .. .. .	+	+	+	+	+	+	179	153	70	110
Appendicitis .. .. .	139	131	235	221	242	186	165	190	134	185
Hernia and intestinal obstruction .. .. .	176	200	209	73	81	94	127	130	118	118
Biliary calculi .. .. .	+	+	+	+	+	42	42	50	44	42
Other diseases of the liver .. .. .	+	+	+	+	+	60	72	68	60	66

<sup>1</sup> "+" indicates that the numbers are too small to give satisfactory estimates of the masculinity.

TABLE IV.

The Mortality in Australia from Appendicitis and Typhlitis.

Period.	Sex.	Deaths per Million per Annum at Ages (Years).									
		0 to 4.	5 to 14.	15 to 24.	25 to 34.	35 to 44.	45 to 54.	55 to 64.	65 to 74.	75 and Over.	All Ages.
1908 to 1910 .. .. .	M.	10	105	113	81	70	83	93	97	77	86
1911 to 1920 .. .. .	M.	19	79	108	86	87	100	117	100	93	83
1921 to 1930 .. .. .	M.	32	63	110	83	91	120	145	145	137	91
1931 to 1940 .. .. .	M.	46	64	101	86	97	130	165	207	188	102
1941 to 1945 .. .. .	M.	44	48	(48)	(44)	(57)	86	127	189	198	70
1946 to 1950 .. .. .	M.	22	17	28	26	37	56	83	106	143	42
1908 to 1910 .. .. .	F.	22	72	79	64	53	63	58	84	51	62
1911 to 1920 .. .. .	F.	17	70	67	54	55	72	52	79	62	58
1921 to 1930 .. .. .	F.	21	57	56	51	54	77	79	94	85	57
1931 to 1940 .. .. .	F.	33	49	43	39	40	70	100	109	140	55
1941 to 1945 .. .. .	F.	22	40	32	22	25	37	65	87	135	39
1946 to 1950 .. .. .	F.	15	16	17	14	13	26	38	56	93	23

TABLE V.  
The Mortality in Australia from Ulcers of the Stomach and Duodenum.

Period.	Sex.	Deaths per Million per Annum at Ages (Years).									
		0 to 4.	5 to 14.	15 to 24.	25 to 34.	35 to 44.	45 to 54.	55 to 64.	65 to 74.	75 and Over.	All Ages.
1908 to 1910 .. ..	M.	0	2	6	10	25	57	78	92	143	20
1911 to 1920 .. ..	M.	3	1	5	19	39	63	81	84	130	26
1921 to 1930 .. ..	M.	3	0	9	37	94	160	209	242	207	65
1931 to 1940 .. ..	M.	3	0	6	33	118	247	374	461	558	111
1941 to 1945 .. ..	M.	1	0	3	21	79	232	419	573	773	125
1946 to 1950 .. ..	M.	0	0	1	16	63	187	399	604	814	120
1908 to 1910 .. ..	F.	3	1	29	31	42	51	47	56	76	26
1911 to 1920 .. ..	F.	3	1	12	22	38	38	46	72	87	21
1921 to 1930 .. ..	F.	3	1	5	12	29	54	85	120	143	25
1931 to 1940 .. ..	F.	2	1	3	8	21	43	88	154	234	29
1941 to 1945 .. ..	F.	1	1	3	7	21	35	70	144	323	32
1946 to 1950 .. ..	F.	1	1	1	7	18	31	56	154	260	30

TABLE VI.  
The Mortality in Australia from Hernia and Intestinal Obstruction.

Period.	Sex.	Deaths per Million per Annum at Ages (Years).									
		0 to 4.	5 to 14.	15 to 24.	25 to 34.	35 to 44.	45 to 54.	55 to 64.	65 to 74.	75 and Over.	All Ages.
1908 to 1910 .. ..	M.	223	20	24	28	49	94	233	605	1093	100
1911 to 1920 .. ..	M.	252	15	23	34	57	111	214	534	1248	107
1921 to 1930 .. ..	M.	162	15	28	28	52	107	233	435	1141	97
1931 to 1940 .. ..	M.	139	14	23	22	43	85	186	445	977	91
1941 to 1945 .. ..	M.	134	19	(11)	(15)	(38)	84	201	417	1061	96
1946 to 1950 .. ..	M.	102	9	11	14	29	67	154	364	1081	86
1908 to 1910 .. ..	F.	121	13	9	25	66	114	231	571	1163	84
1911 to 1920 .. ..	F.	139	12	12	37	69	116	240	525	1184	92
1921 to 1930 .. ..	F.	91	7	14	38	66	116	182	410	1072	84
1931 to 1940 .. ..	F.	79	7	11	30	53	90	146	342	831	78
1941 to 1945 .. ..	F.	79	7	12	30	50	78	150	303	828	83
1946 to 1950 .. ..	F.	57	7	8	19	41	62	124	254	718	72

improvements at the higher ages, especially for males, are disappointing.

#### Discussion.

This group is of some interest in discussing the reason for the general decline in mortality from all causes. Improved medical care, including surgery, is often given as a leading cause of the decline. This group and the cancers include the vast bulk of the surgical work in a general hospital. Neither group of diseases shows the great decline found in the infections. It is possible that a number of the diseases of this class are associated especially with civilization, and the mortality rates have been adversely affected by social factors. However, it is not possible to give here an adequate discussion of such factors.

#### Summary.

The paper is itself a summary of the official statistics of Australia dealing with diseases of the alimentary system (excluding cancers and specific infections). Although many of the diseases of this group show declines, these declines have contributed little to the general decline of mortality in Australia. In males, mortality due to ulcers of the stomach and duodenum has actually risen.

#### Acknowledgements.

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## Reports of Cases.

### THREE CASES OF TRANSIENT CONFUSIONAL PSYCHOSIS IN PATIENTS RECEIVING CONCURRENT ANTABUSE AND PARALDEHYDE THERAPY.

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In 1948 Jacobsen and Hald noted disagreeable symptoms which followed the ingestion of alcohol by individuals who were taking tetraethylthiuram disulphide. They conceived the idea that this drug (now commonly known as "Antabuse") might be valuable as an adjunct in the treatment of the alcoholic.

Over the years since it was first so used, numerous observers have reported the occurrence of transient psychotic reactions in persons receiving the drug. There has been difference of opinion as to whether the mechanism of such reactions is toxic or psychogenic.

The manifestations of the ordinary alcohol-"Antabuse" interaction are well known, and consist of predominantly cardio-vascular disturbances—for example, flushing, tachycardia, hypotension. Investigations have shown correlations between the intensity peaks of such manifestations and the peaks of blood acetaldehyde concentration. In addition, the symptoms have been reproduced in animals by the intravenous infusion of acetaldehyde.

The metabolism of a molecule of ethyl alcohol in the body is believed to follow this sequence:



sequela. At present he shows a relatively stable adjustment and has been taking "Antabuse" at his own request for six months.

#### Discussion.

Although it is difficult to separate out cause and effect in these stories, it does seem at least possible that the confusional episodes were related to interaction of paraldehyde and "Antabuse".

As has been pointed out already, paraldehyde is a simple polymer of three molecules of acetaldehyde. It is therefore obvious that one should anticipate trouble if the drugs are administered concurrently. However, it is of interest that in the foregoing three cases the symptoms and signs were not those of the usual cardio-vascular manifestations one expects to result from a raised blood acetaldehyde content, but were those of toxic confusional states.

Carver has stated that when a resistant person receiving a small regular dose of "Antabuse" manages also to take small quantities of alcohol, he develops, as the days go by, in addition to a pink complexion shortly after drinking, peripheral neuritis and mild general confusion. The appearance of mental confusion due to an "Antabuse"-paraldehyde incompatibility could be of similar origin. The exact mechanism of production of such confusion is not clear. It may be that the type of syndrome resulting from a raised blood acetaldehyde content (that is, whether the patient gets a red face or mental confusion) depends on quantitative factors, such as the rate of formation of acetaldehyde, the amount formed and the duration of its action. On the other hand, the inhibition of aldehyde oxidase by "Antabuse" might alter paraldehyde's metabolic sequence in such a way as to form, not acetaldehyde, but an unknown metabolite, toxic to nervous tissue. A third possibility is that excess accumulation of paraldehyde itself is involved, at least as a contributory factor. Finally, deficient nutrition may play a part, particularly late in the period of mental confusion when food intake may have been inadequate for several days.

It is of interest that "Antabuse" is reported also to lower the oxygen utilization of nervous tissue, prolong the effect of barbiturate sedation in mice and increase the likelihood of cardio-vascular complications during anaesthesia.

In conclusion, one may consider the following precautions to be essential whenever "Antabuse" is to be prescribed:

- (i) a careful check of the physical health of the patient;
- (ii) prescription of the smallest possible dosage of "Antabuse";
- (iii) careful supervision of the concurrent administration of other drugs—for example, paraldehyde, other sedatives, perhaps amphetamine;
- (iv) care to warn the patient seriously of the dangers of drinking alcohol whilst taking "Antabuse";
- (v) refusal to prescribe "Antabuse" without the patient's knowledge and cooperation.

#### Summary.

1. Three cases of transient confusional state have been described.
2. The possibility that these were due to "Antabuse"-paraldehyde incompatibility has been discussed.
3. The relevant pharmacology has been briefly mentioned and suggestions have been made as to the reason for development of mental confusion.
4. Essential precautions in "Antabuse" therapy have been reviewed.

#### Acknowledgements.

I should like to thank the Chairman of the Repatriation Department for permission to publish the abridged case histories concerned in this paper. I am also grateful to Dr. Alan Stoller, former Commonwealth Consultant in Psychiatry to the Repatriation Department, for assistance in obtaining relevant references, and to Professor F. H. Shaw, Department of Pharmacology, University of Melbourne, for his helpful comments.

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#### A CASE OF MULTIPLE PREGNANCY: QUADRUPLTS.

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with a Pathological Report by T. H. VICKERS,  
 Brisbane.

It has been reported that quadruplets occur about once in every 512,000 pregnancies.

#### Clinical Record.

Mrs. A, aged thirty-two years, presented herself on February 14, 1955. She gave a history of having her last menstrual period on November 13, 1954, and of being slightly nauseated since the end of December. She had been married for eighteen months and had had no previous pregnancies. Her menstrual periods were irregular, occurring every twenty-eight to forty-two days.

Investigation of her past history revealed that she had had an appendectomy in 1940, and a gastro-jejunostomy for a duodenal ulcer in 1948. Examination revealed that the fundus was enlarged to the size of approximately a sixteen weeks pregnancy and the cervix was softened. Her heart was normal, her blood pressure was 130 millimetres of mercury, systolic, and 70 millimetres, diastolic, her urine was clear and her weight was eight stone.

When examined on March 8, she reported having felt movements about February 21, her blood pressure and urine were normal and her weight was eight stone three pounds.

On April 5 her haemoglobin value was 11.8 grammes per centum (81%) and her blood group B, Rh-positive. The uterus was the size of a twenty-six weeks pregnancy, and as no foetal parts could be felt and as the period of amenorrhoea was approximately twenty-one weeks, the possibility of a multiple pregnancy was entertained and an X-ray examination of the abdomen was ordered to establish the diagnosis. The film taken on April 14 (Figure 1) was reported upon as follows:

There are three heads visible above the pelvis and a less well defined but definite head overlying the pelvis and there would appear to be quadruplets present—foetal calcification is fairly early and would suggest some further films at a slightly later date.

The diagnosis of multiple pregnancy having been made, it was considered that she should have more rest and no exertion. This was to minimize the risk of any toxæmia or of premature labour. She was given a diet of low sodium content, and "Fergon" tablets were ordered. Regular visits were made and she showed no variation of blood pressure. Her urine remained clear, there was no oedema and the fundus was at the level of the xiphisternum when she was examined on May 19. Her weight increased gradually, being 10 stone one pound on June 6. On this

day her haemoglobin value was 12.9 grammes *per centum* (88%) and another X-ray film was taken. This was reported upon as follows:

Fœtal development appears satisfactory. I would say the fetal age of the quadruplets would be closer to 32 than 36 weeks.

The "Fergon" tablets were replaced by "Fergon with B. Complex", three daily. She was also given "Calvita" tablets, three daily. She now showed slight œdema of the ankles in the evening.

On June 22 she complained of an itchy rash on her arms and legs, which was relieved temporarily by daily "Antistine" injections and "Anthisan" cream.

On June 29 her blood pressure was 115 millimetres of mercury, systolic, and 75 millimetres, diastolic, her urine was clear, her weight was 10 stone five pounds and she had a minimal amount of œdema. At this stage it was decided to admit the patient to hospital as she was most uncomfortable, and it was thought that hospital bed rest might forestall the onset of premature labour.

On admission to hospital she was given a diet of high protein and low sodium content. The "Fergon with B. Complex" and "Calvita" were continued with the addition of vitamin C (50 milligrammes), stilbestrol (five milligrammes), vitamin K (10 milligrammes), each twice daily, and phenobarbital (0.5 grain), three times daily.

On July 2 her haemoglobin value was 13.5 grammes *per centum* (94%) and her serum protein content 4.8 grammes per 100 cubic centimetres, and her weight was 10 stone seven pounds. She complained of irregular abdominal pains, and weak uterine contractions could be felt. These continued irregularly until July 5, when the pains became more severe and the contractions stronger. Another X-ray examination was made to ascertain the relative positions of the fœtuses. This revealed one vertex and three breech presentations; one of the last three fœtuses was entering the pelvis (see Figure 1). From this time she was kept in bed; the pains and contractions, although less severe and less frequent, continued irregularly until July 12.

At 1 a.m. on July 12 labour was definitely established, and at 2 a.m. the membranes ruptured. On vaginal examination the cervix was dilated to about two fingers, and a fœtus was presenting by the breech. Labour progressed normally and at 5 a.m. the contractions were very strong, occurring every ten minutes; she was given a mixture of 20 grains each of potassium bromide and chloral hydrate. At 6 a.m. she was becoming distressed, and an injection of one cubic centimetre of "Heptalgin" was given, with effect. At 7 a.m. the cervix was three-quarters dilated, with pains occurring every three to four minutes, and so she was transferred to the labour ward. A further injection of "Heptalgin" (one cubic centimetre) was given at 7.30 a.m. At 8.30 a.m. labour was progressing satisfactorily and an intravenous drip administration of 5% glucose solution was begun. At 9.30 a.m. dilatation was complete, and a local anæsthetic of 1% "Xylocaine" solution was injected, a medio-lateral episiotomy was performed and "Xylocaine", diluted with normal saline, was infiltrated into the perineum and pelvic floor. A breech presented, and at 9.55 a.m., by the use of the Mauriceau-Smellie-Veit method for the after-coming head, a normal living male infant weighing five pounds 11 ounces was delivered. His condition was good, and after the airway had been cleared and the cord had been tied, he was placed in a "Humidicrib" and transferred to the nursery.

The mother's condition was very good, and she was left to rest until the second membranes were artificially ruptured at 10.45 a.m. A head was presenting, but was still high above the pelvis. Contractions commenced and occurred every three minutes. On examination of the patient at 11 a.m. there was found to be a hand presenting, a prolapsed cord and a head partly extended, still very high. An internal version was performed and a leg was pulled down. At 11.15 a.m. a breech extraction was performed of a male infant weighing five pounds five and a half ounces. On delivery he was cyanosed and very "mucousy". He responded to oxygen after extraction of

mucus, and was placed in a "Humidicrib" and transferred to the nursery, receiving oxygen continuously.

The mother's condition was still good, but at this stage the intravenous administration of glucose was replaced by that of blood serum. At 11.50 a.m. the third membranes were artificially ruptured and a breech presented. Labour progressed until 12.10 p.m. when a female infant weighing three pounds six ounces was delivered. Although she was small, her condition was good, and after extraction of mucus she was placed in a "Humidicrib" with an oxygen supply and transferred to the nursery. Contractions continued, and at 12.25 p.m., with a breech presenting, the bulging membranes were ruptured and a female infant



FIGURE 1.

weighing four pounds 11 ounces was delivered. She had *asphyxia pallida* and her condition was poor. The cord, which was not pulsating, was immediately tied. After extraction of mucus she was given oxygen intranasally and an intramuscular injection of "Lobeline" (0.5 cubic centimetre), and was placed in a respirator. She responded to treatment, and after about five minutes, although her breathing was still irregular and gasping, she was placed in a "Humidicrib" complete with oxygen and transferred to the nursery. As soon as the fourth baby was born, the mother was given 0.5 milligramme of "Ergometrine" intravenously and at 12.30 p.m. the placenta were expressed. "Pitocin" (one cubic centimetre) was given intramuscularly and the episiotomy was repaired.

"Open ether" anæsthesia was used throughout, only four ounces being needed, and the blood loss was minimal. On return to her room, the patient was given an injection of morphine sulphate (one-sixth of a grain). As prophylaxis against any infection "Distaquaine" (300,000 units *dis die*) was given for three days.

Her post-partum progress was normal, and on July 15 her haemoglobin value was 13.2 grammes *per centum* (92%). On July 17 she sat out of bed, and since then has made normal progress.

The first baby was removed from his "Humidicrib" after about half an hour and placed in a cot. He was given

glucose water for the first day and on the following day he was put to the breast but would not suck. He was very lethargic and for the first week would seldom take a bottle and had to be fed by gavage with expressed breast milk. On July 18 he was given thyroid (one-tenth of a grain daily) and by July 25 was able to take some feeds from the breast. Thyroid therapy was then discontinued. On August 1 his hæmoglobin value was 16.2 grammes per centum (111%).

The second baby was left untouched for twenty-four hours, as his breathing was somewhat irregular. The following day he was given glucose water, then diluted expressed breast milk, the strength being gradually increased until (partly by bottle and partly by gavage) he was having full-strength breast milk by July 18. On July 16 he was taken out of the "Humidicrib" and placed in a cot. By July 24 he was able to take to the breast. On August 1 his hæmoglobin value was 16.2 grammes per centum (111%).

The third baby was left undisturbed for twenty-four hours. Glucose water was then given the next day, followed by expressed breast milk and glucose water. This was gradually increased in strength until July 19, when she was receiving full-strength expressed breast milk. She was able to suck strongly for short periods, but as she took these feeds very slowly, many of them were administered by gavage. She remained in her "Humidicrib" until July 28. On August 1 her hæmoglobin value was 12.8 grammes per centum (116%).

The fourth baby, whose condition was poor at birth, improved rapidly and was quite normal after twenty-four hours. She was treated in the same way as the second baby and was removed from her "Humidicrib" on the same day. On August 1 her hæmoglobin value was 15.3 grammes per centum (106%).

With the exception of the firstborn, the babies were each given oxygen continuously in the "Humidicrib" until 6.30 p.m. on the day of birth. After this, no more oxygen was given, and they all maintained a good colour. Each of the babies was given 300,000 units of "Distaquaine" daily for the first two days. Five milligrammes of vitamin K were given daily for three days. From July 15 they were given ascorbic acid, 25 milligrammes daily, and from July 26 "Pentavite" and "Fergon Elixir".

TABLE I.

Date.	First (Boy).	Second (Boy).	Third (Girl).	Fourth (Girl).
	lb. oz.	lb. oz.	lb. oz.	lb. oz.
July 12 .. ..	5 11	5 5½	3 6	4 11
July 16 .. ..	5 0½	4 11	2 15	4 0½
July 24 .. ..	5 1½	4 14½	3 1	4 9½
August 1 .. ..	5 13½	5 6	3 9	5 0
August 13 ..	6 8	6 5	4 6½	5 15½
September 14 ..	8 13	8 9	6 1½	8 2

## Summary.

A case of multiple pregnancy has been reported. The presence of quadruplets was diagnosed early at about five months, so that there was ample time for special preparations to be made. Also precautions could be taken to prevent any of the complications which are especially likely to occur in a multiple pregnancy. The possibility of toxæmia was minimized by extra rest, a diet of low sodium content and frequent examinations. Extra rest and early admission to hospital helped to prevent the onset of premature labour. As a preventive against uterine inertia stilbæstrol and vitamin C were given in the latter weeks. Vitamin K was given to prevent any hæmorrhagic complications in either the mother or the babies. The hæmoglobin level was maintained at a normal figure by the administration of iron. Intravenous therapy was given in case of a long labour and to combat any possible shock. Heated "Humidicrib" and all other possible equipment for the resuscitation of premature infants were in readiness from the beginning of labour.

## Pathological Report (T.H.V.).

## Macroscopic Examination.

The specimen consisted of the placenta, the membranes and the attached umbilical cords of a quadruple pregnancy. Together they weighed 1490 grammes in the state in which they were received. There were four amniotic sacs each of approximately equal size. No communication existed between any two sacs, and there was a single opening into each, through which the fetuses had been delivered. As far as could be determined the membranes were intact.

The placenta of two of the sacs were separate organs, although they touched along about three centimetres of their apposed margins. Each of these placenta measured



FIGURE II.

The placenta viewed from the foetal aspect. The thinner of the two umbilical cords attached to the fused placenta has been positioned to show the web of amnion raised at its point of intersection.

approximately 17 centimetres in diameter and both were roughly circular in shape. The umbilical cord attached to one of these measured 33 centimetres in length, and its diameter varied between one centimetre and one and a half centimetres. The cord was inserted centrally. To the second placenta was attached 35 centimetres of umbilical cord, and at no point was the diameter of this greater than one centimetre. This cord had a marginal insertion.

A single placental mass of roughly oval shape and measuring 24 centimetres by 15 centimetres in its major axes was associated with the other two amniotic sacs. Inspection of the uterine aspect of the mass revealed a shallow furrow running across the minor diameter, and this corresponded to the line of insertion of the common membrane separating the two amniotic cavities on the foetal surface of the organ. This furrow divided the placental mass unequally into two portions having respectively an average diameter of 13.5 centimetres and 15 centimetres. The cord attached to the larger portion measured 38 centimetres in length and approximately one and a half centimetres in average transverse diameter. Twenty centimetres from its central point of insertion the cord divided into two portions, one including an umbilical artery, the other containing the umbilical vein and the second artery. The cord attached to the smaller portion of

the placenta was centrally inserted and measured 40 centimetres in length by less than one centimetre in transverse diameter. Both cords associated with the fused placental masses raised on their amniotic surface a small web of membrane which was absent in the two other placentae.

There was no gross abnormality in the parenchyma of any of the placentae. Figure II shows the placenta viewed from the fetal aspect. The thinner of the two umbilical cords attached to the fused placenta has been arranged to show the web of amnion raised at its point of insertion. Figure III shows the placenta viewed from the uterine aspect. The three placental masses are shown and the shallow groove dividing the largest into two unequal portions can be discerned.



FIGURE III.

The placenta viewed from the uterine aspect. The three placental masses are shown, and the shallow groove dividing the largest into two unequal portions can be discerned.

#### Microscopic Examination.

A portion of the common membrane separating the two amniotic cavities belonging to the fused placenta was examined. The membrane was composed of an amniotic layer on each surface, with two chorionic layers between them separated over the greater extent of the section by an artefact cleft. This indicates that although forming a single mass the two placentae arose from two separate implantations.

#### Acknowledgements.

I wish to thank Dr. John Trewin for his assistance with anaesthetics and intravenous therapy; and the Department of Health, Brisbane, for making available the extra equipment needed. I am indebted to Dr. Felix Arden for his advice on the condition and feeding of the babies; to Dr. Murray Elliott for his helpful suggestions in writing this report; to Dr. E. Johnston for his report on the X-ray films; to Dr. T. H. Vickers, of the Pathology Department of the University of Queensland Medical School, for his report on the placenta; to Mr. E. Hollywood, of the photographic department of the University of Queensland, for photographs of the placenta; and to Professor B. T. Mayes, of the University of Sydney, for reading through this report and making prints of X-ray films available.

## Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Advances in Pediatrics", edited by S. Z. Levine, associate editors John A. Anderson, Margaret Dann, A. Ashley Weech, Myron E. Wegman and Warren E. Wheeler; 1956. London: The Year Book Publishers, Incorporated. Volume VIII. 9" x 6", pp. 273, with illustrations. Price: \$8.00.

Contains articles on the aetiology of infantile diarrhoea, iso-sexual precocity in boys, sarcoidosis in childhood, offspring or diabetic and pre-diabetic mothers, subdural lesions in childhood, prevention of accidents in childhood and mental deficiency.

"Food Poisoning", by G. M. Dack, Ph.D., M.D.; Third Edition: 1956. Chicago: The University of Chicago Press. 9" x 6", pp. 262. Price: \$6.00.

First published in 1943.

"Doctor and Patient and the Law", by Louis J. Regan, M.D., LL.B.; Third Edition: 1956. St. Louis: The C. V. Mosby Company, Melbourne: W. Ramsay (Surgical), Limited. 9½" x 6½", pp. 716. Price: £6 17s. 6d.

This book is apparently intended for all classes of readers—"primarily . . . for physicians, dentists, nurses, lawyers, and hospital administrators", but "much of it should be of interest to laymen—to patients and those who may become patients".

"The Treatment of Eczema in Infants and Children", by Lewis Webb Hill, M.D.; 1956. St. Louis: The C. V. Mosby Company, Melbourne: W. Ramsay (Surgical), Limited. 10" x 7", pp. 79, with 39 illustrations. Price: £2 4s.

The articles comprising this book were originally published in *The Journal of Pediatrics*.

"Porphyrin Biosynthesis and Metabolism", a Ciba Foundation Symposium. Editors: G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Elaine C. P. Millar, A.H.W.C., A.R.I.C.; 1955. London: J. and A. Churchill, Limited. 8" x 5½", with 70 illustrations; pp. 320. Price: 30s.

One of the series of Ciba Foundation Symposia.

"The Medical Clinics of North America." Chicago Number: 1956. Philadelphia and London: W. B. Saunders Company, Melbourne: W. Ramsay (Surgical), Limited. 6" x 8½", pp. 278, with illustrations. Price: £8 2s. 6d. per annum with cloth binding and £6 15s. per annum with paper binding.

Consists of a symposium on medical problems of the aged. There are 22 chapters and 38 contributors.

"Psychopathology of Childhood", edited by Paul H. Hoch, M.D., and Joseph Zubin, Ph.D.; 1955. New York, London: Grune and Stratton. 8½" x 5½", pp. 310. Price: \$6.00.

The proceedings of the 44th annual meeting of the American Psycho-Pathological Association held in June, 1954.

"Preparing for Motherhood: A Manual for Expectant Parents", by Samuel R. Meaker, M.D.; 1956. Chicago: The Year Book Publishers, Incorporated. 8" x 5", pp. 196, with illustrations.

The author is professor emeritus of gynaecology in the Boston University School of Medicine.

"Pediatric X-Ray Diagnosis: A Textbook for Students and Practitioners of Pediatrics, Surgery and Radiology", by John Caffey, A.B., M.D.; Third Edition: 1956. Chicago: The Year Book Publishers, Incorporated. 10" x 7½", pp. 1083, with many illustrations. Price: \$28.00.

The first edition was published in 1945.

"The Surgical Clinics of North America." Chicago Number: 1956. Philadelphia and London: W. B. Saunders Company, Melbourne: W. Ramsay (Surgical), Limited. 9" x 6", pp. 261, with 60 illustrations. Price: £8 2s. 6d. per annum with cloth binding and £6 15s. per annum with paper binding.

Comprises a symposium on diagnosis in general surgery, with three additional articles. There are 24 articles with 39 contributors.

## The Medical Journal of Australia

SATURDAY, MAY 12, 1956.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the *Quarterly Cumulative Index Medicus*. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

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### SIGMUND FREUD.<sup>1</sup>

SIGMUND FREUD, who was born one hundred years ago on May 6, 1856, began as a neurologist. In addition to work on the comparative anatomy of the nervous system, he wrote two notable monographs, "Aphasia" (1891) and "Cerebral Diplegia in Childhood" (1893). As he related in his autobiography (1924), racial prejudice and certain other considerations discouraged him from pursuing a career as a clinical neurologist, and already during a year under Charcot in 1885 he had become interested in hysteria, an interest which was fostered by a visit to Bernheim in Nancy, and by Joseph Breuer's successes with the treatment of hysterics by evoking the recall of traumatic incidents under hypnosis, with accompanying emotional discharge (catharsis and abreaction). "Studies in Hysteria" (1895) presented the results of Breuer's and Freud's collaboration. Breuer then seems to have lost interest, and Freud carried on the work alone, abandoning hypnosis and evolving his method of "free association", in due course discarding the single traumatic experience in infancy as a cause of neurosis and abreaction as a therapeutic agent. Out of the memories and phantasies of infancy elicited from his patients in the course of analysis

was constructed the conception of infantile sexuality, subject to arrest of development at various stages on the road to maturity, with a latent period between the age of about five years and puberty, and repression of infantile sexual memories.

At the time that Freud began his life's work, Kraepelin was introducing order into the classification of mental disorders, mainly the institutional insanities and mental deficiencies; but beyond reference to heredity and degeneracy there was little understanding of aetiology, and slight attention was paid to minor deviations from mental normality. Freud set out to determine the meaning of symptoms and the early influences which might be responsible for neurosis, and with the accumulation of observations he developed theories also as to the formation of character. In the course of this work he called attention to the indefinite line of demarcation between the psychologically normal and the pathological.

In the paper delivered on his behalf at the Ninth Session of the Australasian Medical Congress (1911), republished in this issue, Freud referred to the dynamic approach of psychoanalysis, repression, free association and the origin of neurosis in the mishandling by adults of infantile sexuality and also to the restrictions on sexual gratification imposed by culture, but sublimated into artistic and other creative activities. He named infantilism, sexuality and repression as marking the outstanding differences between psychoanalytic and other theories concerning abnormal mental states.

In the following paper Havelock Ellis criticized Freud for his readiness to generalize from limited and selected clinical observations and for rejection of data that failed to support his theories. He expressed disagreement with Freud's psychology of dreams, particularly with regard to the interpretation of dream contents. Ellis, however, in spite of his own considerable researches, offered no special comment on Freud's theory of sex, which he reviewed at some length.

The basic conceptions propounded in 1911, supported by much additional material and expanded, underwent no essential modification in the course of years. In 1926 Freud described his system as (a) dynamic, dealing with instincts (mainly sex); (b) economic, concerned with reconciliation between the pleasure-pain principle and reality; and (c) topographic, dealing with the relative predominance of the Id, instinctive life, the Ego, general personality, and the Super-Ego, conscience. It is interesting to note that in the same article he suggested that psychoanalysis would become more important as the science of the unconscious than as a therapeutic measure. Directly and indirectly Freudian teaching has had a wide influence not only in psychiatry and psychology but in such special fields as education, anthropology and criminology.

Freud's final statement was published posthumously in 1940, "dogmatically", as he wrote in the preface, with the caution that no one who has not repeated on himself or others the observations on which psychoanalytic doctrine is based, is in a position to pass independent judgement. When he wrote that instincts originated in the somatic organization, that capacity to withstand stress varied with the constitution of the individual and that instincts might be too powerful for the Ego, "in the same way as

<sup>1</sup>Unless stated otherwise, the references are to English translations of Freud's works published in the "International Library of Psycho-analysis, London".

Freud, S.: (1911) Transactions of Australasian Medical Congress, Ninth Session, Sydney; (1911) "Psychoanalytic Notes upon a Case of Paranoia"; (1920) "Beyond the Pleasure Principle"; (1922) "Introductory Lectures on Psychoanalysis"; (1924) "An Autobiographical Study"; (1926) "Psychoanalysis", *Encyclopaedia Britannica*, Thirteenth Edition, London; (1933) "New Introductory Lectures on Psychoanalysis"; (1940) "Outline of Psychoanalysis".

Jones, E.: (1955) "Sigmund Freud, Life and Work", London.

an excessive stimulus from the external world", he made concessions rather than contributions to current thought. He also allowed that traumatic neuroses, following severe fright or somatic shock, might be exceptions to the rule that "in every case the subsequent neurotic illness has its prelude in childhood as its point of departure". He does not appear to have considered that weak instincts or libido rather than repression might be responsible for deviations and perversions, nor was he interested in involution and its repercussions on the mind. In postulating two basic instincts, Eros, creative, the energetic aspect of which he named "libido", and Thanatos, the death instinct, "the task of which" he said in a previous publication (1920) "is to lead organic matter into the inorganic state", he did little more than elaborate the conception of anabolism and katabolism. Years before (1915) he had said in a course of lectures, "Psychoanalytic doctrine which we have created is in reality but a superstructure which will have to be set on its organic foundation some time or other; but this foundation is still unknown to us", and he continued to limit his vision to the superstructure. Freud had less to say about the psychoses than the neuroses, with the exception of melancholia. Schizophrenic and paranoid individuals are seldom accessible to the psychoanalytic examination. He did, however, through an autobiography and other writings interpret the case of Dr. Schreber (1911) on a basis of repressed homosexuality, an interpretation which has not proved to be generally valid for paranoid states. Depressives more readily submit themselves to investigation, and Freud (1917), contrasting mourning for the loss of a loved person and melancholia, sought to demonstrate that the self-reproaches of the latter are in reality hate turned inward, because of the intolerable nature of hate towards another, usually the mother who failed the patient in love relationships in infancy. Sadism thus turns to suicide. Although this is only part of the suggested mechanism underlying melancholia, it provides an example of the tortuous reasoning which underlies so much of Freudian doctrine. Freud himself was less satisfied with an explanation of the occasional swing over into mania.

Among the more regrettable misconceptions and misconstructions of Freud's teachings are those which concern his attitude to morality. His emphasis on the warping of character and the emotional disturbance which may result from a prudish and disciplinary attitude on the part of adults towards infantile exploratory and pleasurable fumbings with the genitalia and inconvenient excretory performances, as well as the neurotic manifestations of sex frustration in later years, were held in some quarters to be indications for complete freedom for self-expression in childhood and relaxation of moral standards in later years. Certainly Freud (1940) wrote "the child's ego comes to grief over the task of mastering the excitations of the first sexual period" and "we recognise the essential precondition of neurosis in this lagging of ego behind libidinal development". Neuroses could be avoided "if as in many primitive cultures the child's sexual life were allowed free play". On the other hand, with maturity "immediate and regardless satisfaction of instinct would often enough lead to perilous conflicts with the external world". Standards of morality, conscience, the Super-Ego "represent the influence of childhood, of the care and education" given to the child, and in this connexion Freud

called attention to the personal qualities of the parents, the tastes and standards of the social class and the characteristics and traditions of the race. In brief the Super-Ego "represents more than anything the cultural past". The task of psychoanalysis, as of other methods of mental exploration, is to help the patient to get an honest insight into his motives, not to dictate standards of conduct. In solving his conflicts the patient may offend his conscience at his peril. Readers of "Gentlemen Prefer Blondes" will recall that the fair lady was advised by Freud to exercise more repression. Freud never set out to establish a new morality, but rather to demonstrate the importance of morals.

Freud's short autobiography (1924) and the searching biography by one of his earliest pupils, Dr. Ernest Jones (1955), reveal that much of psychoanalytic theory was based on Freud's introspections. He not merely experienced but suffered from conflicts in regard to his father. Freud was an autocrat with a mission who, after discarding hypnosis and the nosogeny of the single traumatic experience in infancy, never deviated from pansexualism and analysis by so-called "free" association. The rigid discipline which he imposed on patients and pupils stifled criticism, of which he was intolerant. Hence the data of psychoanalysis, the utterances of analysands voiced in an artificial situation, so different in quality from the facts of physical science, not only detract from the claim that psychoanalysis is a branch of science, but continue to be regarded as unreliable and even unverifiable by non-analysts. Carl Jung left the Freudian fold in disagreement with the narrow definition of libido, and Adler, another of Freud's early followers, flatly denied the primacy of sex in motivation in favour of self-preservation and self-determination. Certainly at a time of stagnation in psychiatry Freud showed how to look beneath the surface and search for motives in conduct. He demonstrated the importance of studying the maturation of the individual, and he stressed the impressionability of the infant and the potency of parental attitudes in the formation of personality. Above all, he shocked the Western world into a lively and productive interest in psychology. One may speculate whether Freudian theory would have received the same amount of attention had its author been less detached and at more pains to see common ground between his own work and contemporary psychology, neurophysiology and biology. His fanciful terminology and mythological analogies probably appealed more to the uninformed laity than to physicians. On the therapeutic side much reference in popular literature and on the screen has no doubt enhanced the elements of suggestion in the procedure of analysis, and modifications in technique including short-term treatments have been introduced by workers professing all grades of allegiance to Freudian theory. At the present time psychoanalysis is more in favour in the United States than in any other Western country.

While Freud declared that psychoanalysis has made notable contributions to science, he rejected any claim to an independent philosophy of life (*Weltanschauung*) (1933). But he placed himself alongside Copernicus and Darwin since "mankind is now suffering the third and most bitter blow" by the demonstration that "the Ego of each one of us is not master in his own house". In spite of the

deterministic and materialistic character of psychoanalytic theory, including the iconoclastic conception of God as an escapist illusion, the system has made no impact against Marxism and Pavlovian reflexology, and his doctrines were obnoxious to the Nazis who wrecked his publishing establishment when they seized Austria in 1938. Freud had already moved to London, where he died in 1939.

## Current Comment.

### TREATMENT OF TRICUSPID STENOSIS.

ONE of the most recent and daring of surgical procedures is that of mitral valvotomy. By far the most frequent sequelae of acute rheumatism are irreversible damage to the myocardium and scarring, fibrosis and stenosis of the mitral valve. The immediate mitral insufficiency and the eventual stenosis throw onto the right side of the heart a greatly increased load which eventually it is unable to bear. Mitral valvotomy in selected cases, while not restoring the mitral valve to its pre-rheumatic state, does enable blood to flow without hindrance into the left ventricle and releases the greater part of the pulmonary back pressure. Attention has since been drawn to rheumatic lesions of the other cardiac valves. P. Wood<sup>1</sup> suggested that the rheumatic process has no specific predilection for the mitral valve, but that lesions resulting are proportional to the degree of stress to which the particular valve is normally subjected. On this basis he explains that, supposing the mitral valve was involved in 80% of cases of acute rheumatism, then the tricuspid valve would be involved in 12%. The concomitant occurrence of mitral and tricuspid stenosis, according to Wood,<sup>2</sup> presents with some of the clinical features resembling the extreme pulmonary hypertensive group, but with considerable modification of clinical signs, including loss of the accentuated pulmonary second sound, absence of right ventricular preponderance, and a pulmonary artery in which distension has not occurred.

W. B. Neptune and C. P. Bailey<sup>3</sup> reported that mitral valvotomy could be safely performed through a right thoracic approach, and that at the same time any associated lesions of the tricuspid valve could be dealt with at the same operation. It is possible to examine the state of the tricuspid valve through a left hemithorax approach. However, these authors found that finger splitting of the stenosed tricuspid valve was not usually possible, as it, unlike the mitral valve which usually splits readily, is rarely calcified and is leathery in texture. Instrument splitting of the tricuspid is thus always necessary when this valve is stenosed.

In a recent paper, J. D. Chesterman and W. Whitaker<sup>4</sup> suggest that in Great Britain on the basis of 15% of cases of tricuspid disease being stenotic, there would be 50 patients each year who would benefit by tricuspid valvotomy. The diagnosis of tricuspid stenosis in the presence of mitral lesions may be difficult. Typically there should be two centres of diastolic murmur intensity, one at the lower end of the sternum and the other over the mitral area. The tricuspid murmur may be intensified by the patient lying on his right side and during inspiration. The murmur may be high pitched of "seagull" type, and there may be an audible opening snap and a thrill localized at the lower end of the sternum. Radiological examination reveals right atrial enlargement, the oesophagus is displaced posteriorly, and the pericardial fluid may be increased. Electrocardiographic findings may be equivocal, but giant a waves and the presence of an increased and pointed P wave in lead II are very useful signs. The authors state that above all, the pathognomonic sign of tricuspid stenosis is the altered pressure gradient found

on catheterization of the right side of the heart. When the valve is stenosed the atrial pressure is raised above that of the ventricle. The catheterization also demonstrates any degree of tricuspid incompetence which may be present. Chesterman and Whitaker have submitted to operation five patients with proved tricuspid stenosis. Three had a mitral valvotomy, one had a tricuspid valvotomy initially, and in one patient a mitral and a tricuspid valvotomy were carried out at the same operation. In the cases of the four patients in whom the mitral and tricuspid valves were treated at different operations, the authors dealt with that valve first which was causing the greater degree of incapacity. One patient died of bronchopneumonia and another died before the second operation. The other three who have survived the double valvotomy are greatly improved. In operating on both valves at the same time, the authors approached the heart through a bilateral fourth intercostal incision with a V-shaped osteotomy of the sternum. Few operations of tricuspid valvotomy have yet been performed since the first of these was carried out by Neptune and Bailey in 1952. It is as yet early to assess the usefulness of the operation, but at present it would seem to hold hope for those patients with post-rheumatic stenosis of both the mitral and tricuspid valves.

### IN-VIVO COAGULATION AND SHOCK.

ANY severe loss of blood is usually followed by serious shock, and the mechanism for this is not clear. J. W. Crowell and W. L. Read have shown<sup>1</sup> that acute circulatory arrest was followed by the appearance in the circulatory system of a large number of small blood clots. Heparin prevents this clot formation and the animal is able to withstand two or more times as long a period of circulatory arrest as he could without treatment. As hemorrhagic hypotension is a period of inadequate circulation the authors suggest that the same mechanism causing hypercoagulation and clot formation during circulatory arrest may also be active in hemorrhagic shock. Dogs were extensively bled quickly into a reservoir containing sodium citrate and the blood pressure was maintained at 50 millimetres of mercury. The blood rapidly became hypercoagulable and the clotting time fell to about two to four minutes. After reinjection of the blood in the reservoir the blood pressure rose to much less than the normal levels, and after a few hours the dogs died. When the dogs were given 10 milligrammes per kilogram of heparin ten minutes before the bleeding the blood coagulation time, with the blood pressure at 30 to 50 millimetres of mercury, did not fall, and after reinfusion of the blood in the reservoir the blood pressure rapidly reached normal. With five millimetres per kilogram of heparin the coagulation time was very erratic both before and after the reinfusion of the citrated blood and half of the animals died.

Reverse perfusion of the lungs of dogs dying from shock showed large quantities of both fibrin and small emboli sufficiently large to block the pulmonary arterioles. It appears that when blood is being lost from the vascular system, some mechanism attempts to stop this loss by increasing the rapidity of coagulation. The greater the hemorrhage or the longer its duration, the more hypercoagulable the blood becomes. It is probable that hypercoagulability is one of the homeostatic mechanisms. A sufficient period of hypercoagulability would apparently cause the formation of solid clots throughout the vascular system, but this is not the case—very small clots were formed in large numbers and were immediately strained out as the blood passed through the organs. It is probable that a critical level of hypercoagulability must be reached, after which many small clots are formed and the animal dies of shock. Since hypercoagulability can be produced by methods other than hemorrhage, it is not improbable that actual coagulation can be caused by a variety of circumstances, and irreversible shock by this

<sup>1</sup> Brit. M. J., May 8, 1954.

<sup>2</sup> Brit. M. J., May 15, 1954.

<sup>3</sup> J. Thoracic Surg., July, 1954.

<sup>4</sup> Thorax, December, 1955.

<sup>1</sup> Am. J. Physiol., December, 1955.

mechanism would not be restricted to hæmorrhage. The authors' summing up is: "It seems probable that irreversible shock produced by hæmorrhage may be due to small blood clots formed as the result of excessive stimulation of the blood coagulability control system."

#### DIAGNOSTIC FEATURES OF PANCREATIC DISEASE.

THE pancreas appears as an uninteresting mass during routine anatomical dissection, it causes for a little time some confusion in the mind of the student of physiology and it is then condemned to a relatively minor role in the interest of the average clinician. This lack of enthusiasm is due, most probably, to the comparative infrequency of pancreatic disease, apart from that of *diabetes mellitus*, to the difficulties of investigating the abnormal states and to the dangers and problems of treatment. Yet the pancreas performs no unimportant role in the mechanism of existence and untreated disease is almost invariably fatal. J. Beck<sup>1</sup> has discussed the diagnostic features of pancreatic disease. He suggests that acute inflammatory lesions of the pancreas are commonly misdiagnosed, and that chronic pancreatic disorders are frequently unrecognized until late in their course of development. One factor contributing to this situation may be a lack of sufficient awareness of the pancreas and its disorders. Another factor is a widespread impression that diagnostic approaches to the pancreas are sharply limited. The clinical, laboratory and radiographic expressions of pancreatic disease are surprisingly many. Pancreatic pain is described by patients in various ways, but it is generally constant and is often said to be boring in type. Posterior radiation of the pain and its exacerbation at night, or at other times when the patient is supine, are highly characteristic of pancreatic disease. Flexion of the trunk often provides some degree of relief, and these patients, especially those afflicted with cancer, typically seek relief by sitting up, bending forward, or walking about with the trunk flexed and the hand pressed against the epigastrium. Jaundice is one of the outstanding features of carcinoma of the pancreas, especially when the head of the pancreas is involved. Indeed, jaundice appearing in the absence of pain is a classical expression of carcinoma of the pancreas. The author considers that pain in patients with carcinoma of the pancreas occurs with a frequency even exceeding that of jaundice. Jaundice without pain, therefore, while diagnostically important when present, does not occur in most patients with carcinoma of the pancreas. Beck reminds us that loss of weight is impressive in patients with chronic affections of the pancreas, especially in those with malignant changes. Behaviour disturbances and personality derangements may be detected surprisingly often in patients with pancreatic disease of various types and particularly in those with cancer. Far too often, he insists, abdominal pain in a person with nervous symptoms tends to be regarded merely as an expression of an underlying psychosomatic disturbance; and only when jaundice makes a belated appearance is its significance fully appreciated. Multiple venous thromboses occur much more often in cases of carcinoma of the body and tail of the pancreas than in cases of carcinoma of other organs. Carcinoma of the body or tail of the pancreas should be considered whenever multiple venous thromboses or migratory thrombo-phlebitis are encountered in an older person, for either of which no other satisfactory causes can be found. Palpable distension of the gall-bladder is one of the traditional physical features of a malignant neoplasm of the pancreas, and a distended gall-bladder may be felt by clinical examination in about half the patients with carcinoma of the pancreas attended by jaundice, and this proportion is increased at operation and at autopsy. Transitory glycosuria and hyperglycæmia are frequently found in patients with acute pancreatitis, and these findings may also be detected during acute exacerbations of chronic relapsing pancreatitis. The

development of abdominal pain in a diabetic patient, or the appearance of diabetic phenomena in a patient with abdominal pain, should lead to a strong suspicion of the possibility of pancreatic disease. The most widely used, and probably the most valuable single means for the recognition of acute pancreatitis, is determination of the serum amylase content. The serum lipase usually reaches its greatest concentration after the amylase value is elevated, but it tends to remain elevated longer. Analysis of peritoneal fluid for amylase content provides another approach to the identification of acute pancreatitis. Determination of the diastase content of the urine provides an easy means of detecting pancreatic disorder, especially with the use of newer and more simplified tests. Opinion, however, varies widely about the value and reliability of such determinations. The serum calcium level tends to be lower when the pancreas is acutely inflamed, particularly when the process is severe and attended by fat necrosis. This lowered level of the serum calcium usually occurs from the second to the fifth day of the disease, and may persist for two weeks or longer. Elevation of the serum alkaline phosphatase content may be found in the presence of pancreatitis, and if present in the absence of hyperbilirubinæmia should direct attention, among other things, to the possibility of disease of the pancreas. The amount of external pancreatic secretion entering the intestine tends to diminish when the pancreas is diseased, and therefore careful examination of the stools may reveal evidence of defective digestion indicative of pancreatic insufficiency. When pancreatic function is impaired and the digestive capacity of the non-pancreatic enzymes is exceeded, the stools become bulky and light-coloured. Steatorrhœa may be recognized grossly by the light, clay colour of the faeces, by the presence of butter or cream-like masses on or in the stool, and by a thick greasy consistency when the stool is smeared. Microscopic examination may reveal droplets of fat or needle-like crystals. Creatorrhœa is perhaps even more indicative of pancreatic insufficiency than is steatorrhœa, and the impaired protein digestion may be recognized by the presence in the faeces of a large number of yellow muscle fibres with square ends, sharp edges, and well-preserved striations. The author describes tests for digestive efficiency, including a gelatin tolerance test and a starch tolerance test, which may serve some purpose as an aid to diagnosis in suspected chronic pancreatitis. Examination of the duodenal contents may provide additional valuable information in certain stages of pancreatic insufficiency. Radiographic studies of the chest, abdomen, alimentary tract and biliary tract may prove useful in the differential diagnosis in cases of suspected pancreatic disease. In effect the clinical, laboratory and radiographic expressions of disorders of the pancreas are numerous; and their diagnostic value is important. Consideration of these features, coupled with an increased awareness of the pancreas, should do much to assure more frequent and earlier recognition of pancreatic disease.

#### BRONCHIAL CARCINOMA WITH PLEURAL EFFUSION.

FROM the early days of the surgical treatment of carcinoma of the bronchus, it was generally considered that the presence of pleural effusion was a strong indication that the neoplasm was already disseminated beyond the reach of the surgeon. Later this view was modified, and A. Goldman<sup>2</sup> stated that pleural effusion was not a contraindication to the surgical treatment of bronchogenic carcinoma unless there was unmistakable evidence of metastasis to the pleura either with visible tumour or with demonstrable malignant cells in the pleural fluid. Later, G. G. Graham<sup>3</sup> *et alii* reported on the results of an investigation of the pleural exudate from each of 333 patients suspected of suffering from bronchogenic

<sup>1</sup> *Dis. Chest*, July, 1949.

<sup>2</sup> *J. Thoracic Surg.*, April, 1953.

<sup>3</sup> *J.A.M.A.*, November 12, 1955.

carcinoma. In 112 of these, malignant cells were discovered, and in 56 of the 112 the primary tumour was one of the bronchus. Of the remaining patients in whom no neoplastic cells were found, 47 had a primary lung carcinoma. Surgical treatment was possible for one patient with demonstrable cells due to the bronchogenic carcinoma, and was also possible for two patients with a pleural effusion but with no malignant pleural cells. M. E. Samo<sup>1</sup> also studied pleural effusion resulting from pulmonary neoplasia. He found that even when cell block and smear studies revealed no evidence of malignant cells in the fluid, it was possible to grow living tumour cells by pleural culture. These cells were typically malignant in character. J. C. Gerrits and A. F. Hakman<sup>2</sup> suggest that as the pleural effusion may result from a secondary inflammatory reaction behind an obstructed airway, the presence of the effusion cannot be regarded as a sign of inoperability. In all, these authors submitted to surgical treatment 12 patients with both bronchogenic carcinoma and pleural effusion, and 21 others with pleural effusion were also discovered at the operations in 201 cases of bronchogenic carcinoma. From these 33 patients with pleural effusion, resection was possible in 13, for whom no involvement of the pleura by the neoplasm could be demonstrated. From a preliminary review of this small series it appears that the survival rate in these 13 patients is the same as that for other operable patients with bronchogenic carcinoma. Examination of the resected specimens revealed that, of the 13, there was an infective process behind the tumour in 10 of them. In one out of the 13 operable patients, and in eight out of the 20 inoperable patients, the pleural fluid was haemorrhagic. The conclusions to be drawn from these reports are that pleural effusion, while a grave sign in the presence of carcinoma of the bronchus, does not, even when haemorrhagic, necessarily imply that the condition is inoperable. Further study on the efficiency of tissue culture of malignant cells in such effusions may provide a means of differentiating those whose lives may be saved from those in whom life is fast and irrevocably ebbing.

#### THE TESTICLE IN INFANCY.

The evidence, significance and prognosis of undescended testicles in the newborn child have been the subject of numerous papers and discussions. The confusion which has resulted from the publishing of widely differing statistics was referred to recently in this journal by A. M. Clarke,<sup>3</sup> who stated that the condition affects about 0.2% of the adult population. From the surgeons' point of view, the difficulty lies in judging the optimum age for surgical treatment. It has been held that descent may occur at any time during the hormonally active years from the age of five to adolescence. At the same time, delay in descent may be accompanied by irreversible changes in a testicle which may otherwise have developed normally. However, little statistical work has been carried out to show whether testicles undescended at birth do later descend without treatment, or whether a maximum age may be reached after which descent is unlikely. E. H. Watson and G. H. Lowrey<sup>4</sup> state that in over 90% of newborn infants the testes are found in their final position in the scrotum. Even recently, many different figures have been reported. Most recently C. G. Scorer<sup>5</sup> has published the findings after the study of 1700 male infants observed from birth to one year of age. To clear some of the past confusion, separate figures were compiled for full term and for premature infants. A normal testicle was considered to be one which could be gently drawn down and held without tension at a distance of four centimetres or more from the pubic crest. Testicles in which this manipulation was impossible were classified as of incomplete descent. For premature infants a separate criterion of normality

was that the testicle should descend 2.5 centimetres or more from the pubic crest. Infants in whom undescended testicles were present were seen at regular intervals as out-patients during the first year of life. The report now published by Scorer deals with the results at hand for the first 1000 male infants studied in their first year of life. Undescended testicles were found in 4% of these. Over the same period the incidence of undescended testicle in 88 premature infants was 33%. On combination of the two groups the incidence of undescended testicle, regardless of the condition of the infant at birth, was 7%. Of the total of 69 infants with this defect, 14 were either stillborn or died within a few days of birth. Follow-up studies revealed that within three months of birth, descent of the testicle occurred in 70% of full term babies, and in 89% of premature infants. Among the remaining 13 infants, descent occurred after three months in six, and at the age of one year descent was still not accomplished in seven. An interesting point noted was that descent of the testicle in the six delayed, but accomplished, cases was slow and never so complete as the normal testicle already present. In the case of the seven undescended at one year, no progress had been observed after the first six weeks of life. The incidence of undescended testicle at the age of one year is thus 0.7%, and as this included one Mongol child it is seen that the incidence of non-descent at one year closely approximates that of the adult, especially as Scorer suggests that the adult incidence is 0.5%. Only a prolonged follow-up study will show the importance of the author's suggestion that complete spontaneous descent of the testicle is unlikely to occur after three months of age, and does not occur after the first year of life.

#### CLOSURE OF LACERATIONS.

The use of sutures for the closure of superficial lacerations has perhaps been somewhat overdone in the past, when the importance of preventing either infection or secondary haemorrhage from a wound was more paramount than in the conditions of the present day. The application of sutures is painful, the suture material as a foreign body delays healing, and the resulting scar is greatly increased. Suturing is safe, it is relatively easy and it requires comparatively little after-care. For the deep wound, in conditions in which subsequent cleanliness is unlikely, and for the active patient in whom temporary discomfort is of little account, the use of the suture is still the method of choice in repair. However, for children, for almost all facial injuries, and for most mild lacerations in non-mobile skin, the insertion of a suture is not necessarily the method of choice. The use of sticking-plaster bridges in such situations and in the absence of profuse bleeding can be a highly successful procedure in the hands of the patient medical practitioner. The anxious fears of children are averted, and with careful technique scarring in minor facial injuries may be almost invisible. This method has the advantage that sterilization of instruments is unnecessary, and all that is needed is the ordinary cleansing of the skin and wound with soap and water. Healing is rapid, dressing is frequently unnecessary, and if properly applied the plaster is easily rolled off after a very few days. From Canada comes a report by P. Williamson<sup>6</sup> of the use of a special material devised for the non-suturing closure of lacerations. The tape used is of transparent polyester film with perforated holes. It is slightly elastic, and the coated adhesive appears to be non-toxic and does not excite allergic reactions. The tape is so manufactured that it drops off in five days. The author has also used the tape for closure of the skin after the suture of deep tissue, and it is also successful for the fixing of skin grafts. Healing is quicker than with conventional methods, scarring is reduced, and there has been less secondary infection. Apparently at the present time the tape is available in America for research only. Its use may prove to be of great assistance in paediatric practice, and in the cosmetic practice of reconstructive surgery.

<sup>1</sup> *Surg., Gynec. & Obst.*, December, 1953.

<sup>2</sup> *Arch. chir. neerl.* (1955), 7:4.

<sup>3</sup> *M. J. AUSTRALIA*, February 11, 1956.

<sup>4</sup> "Growth and Development of Children", Second Edition, Year Book Publishers, Chicago, 1954.

<sup>5</sup> *Brit. J. Urol.*, December, 1955.

<sup>6</sup> *Canad. M. A. J.*, January 15, 1956.

## Abstracts from Medical Literature.

### OBSTETRICS AND GYNECOLOGY.

#### Anæsthetic Hazards in Obstetrics.

F. R. LOCK AND F. C. GREISS (*Am. J. Obst. & Gynec.*, October, 1955) review, from statistics compiled by the Committee of Maternal Welfare in the State of North Carolina, the maternal deaths due primarily to anaesthesia. Among 1733 maternal deaths, 45 (2.6%) were due to the anaesthetic administered. These deaths occurred after aspiration of stomach contents in 13 cases (29%), after spinal shock in 11 cases (24.5%), and after cardiac arrest in seven cases (15.6%). Of the 13 patients who died after the aspiration of foreign material nine had received ether. Immediate death from respiratory obstruction occurred in two cases. The authors state that the delay in the emptying of the stomach associated with late pregnancy is further prolonged during labour. They consider that the recent ingestion of food and, more importantly, the faulty administration of the anaesthetic appeared responsible for the deaths of all except one patient in the series. The following precautions against aspiration during obstetrical anaesthesia are recommended: withholding food and liquids by mouth after the onset of labour, avoiding anaesthesia by inhalation or the intravenous route if the patient has eaten within six hours, and using a transparent anaesthetic mask. If retching or vomiting should occur, the induction of anaesthesia should be discontinued until the stomach is empty. The delivery room should be equipped with a suction apparatus, a laryngoscope and endotracheal airways. The obstructive syndrome is treated by placing the patient in the Trendelenburg position, by suction, by oxygen administration and by bronchoscopy if necessary. Deaths from spinal shock occurred soon after the anaesthetic was administered. The authors consider that severe reactions are common when the dose is excessive or when the level of anaesthesia is too high and affects too great a percentage of the vascular bed. They consider that spinal shock may be avoided with the use of minimal doses and the "saddle block" technique. They stress the importance of constant vigilance because obstetric patients are unusually sensitive to spinal anaesthesia. Seven deaths resulted from cardiac arrest; three of the patients had received trichloroethylene and three cyclopropane. Various anaesthetic agents are discussed as regards their action on heart muscle, conduction and blood supply. Irreversible changes in the vital centres occur within three or four minutes of circulatory arrest. However, 30% to 50% of patients who have cardiac arrest may be saved by immediate diagnosis and treatment. Disappearance of both a palpable pulse and audible blood pressure sounds calls for immediate artificial respiration with 100% oxygen, opening the chest through the fourth left intercostal space and compressing the heart at the rate of 80 to 100 times per minute. The authors conclude that the

chief factors responsible for deaths from anaesthesia in obstetrical practice are both poor selection and faulty administration of the anaesthetic.

#### Radioactive Gold and Carcinoma of the Ovary.

R. S. CRON, I. I. COWAN, R. L. GORTHEY AND F. K. KARIOIS (*Am. J. Obst. & Gynec.*, October, 1955) report and evaluate the results of the treatment with radioactive gold of 28 patients suffering from ovarian carcinoma. When distributed in isotonic saline solution into the peritoneal cavity, the gold "plates" out on to the serous surface and irradiates the malignant cells by intimate contact. The authors state that the basic problem of dosage is to administer sufficient irradiation without damaging normal tissues or causing severe systemic reactions. The treatment is employed in a palliative fashion for patients who have already had ascites due to the peritoneal spread of growth. It is also used prophylactically when there has been evidence of peritoneal spread at the time of operation or when the rupture of a malignant cyst has occurred at operation. Factors such as the patient's general condition, blood picture, presence of abdominal mass and rate of fluid accumulation are to be considered in calculating the dosage. The average dose and the technique of administration are detailed. Radiation hazards to personnel administering radioactive gold and hazards to nursing staff and to visitors are mentioned, and preventive measures are described. The incidence of ovarian neoplasms among 5616 patients treated at the Milwaukee Hospital was 9.1%. Only 11% of all the ovarian neoplasms were malignant in character. Ascites was present in 24.7% of the patients with ovarian carcinoma. Twenty-eight patients were treated with radioactive colloidal gold, chiefly because conventional treatment with surgery and irradiation had failed to control the disease. The predominating types of ovarian neoplasms in the series were serous cystadenocarcinoma, adenocarcinoma and pseudomucinous cystadenocarcinoma. The authors suggest that in this series it is impossible to compare the results in patients treated without gold and with gold, because of the difference of malignant activity in the two groups. Although there was no obvious increase in longevity after the addition of gold treatment to conventional treatment, it was found that the gold treatment reduced and often eliminated the necessity of subsequent paracenteses. The authors and the patients' own physicians have the clinical impression that the administration of radioactive gold resulted in increased comfort to the patient, reduced the rate of fluid formation and gave respite from repeated aspirations.

#### Colposcopy.

L. C. SCHEFFY, W. R. LANG AND G. TATARIAN (*Am. J. Obst. & Gynec.*, October, 1955) report their experiences with colposcopy as an aid in the study of the cervix uteri and in the diagnosis of cervical carcinoma. The principle of colposcopy consists of stereoscopic visualization of the cervix under magnification with direct lighting. The colposcope used is the one employed at present by

Hinselmann and has a built-in Leica attachment for taking 35-millimetre "Kodachrome" pictures. The cervix is viewed after gentle cleansing, then after the application of 3% aqueous acetic acid, and finally after staining with aqueous iodine solution (Schiller's test). The recognition of three normal findings forms the basis of examination. Squamous epithelium appears as reddish pink in colour with fine white dots. Columnar epithelium has a bubbly or grape-like appearance. The transition zone consists of a mixture of both squamous and columnar epithelium. Three varieties of leucoplakia are described in colposcopy: true leucoplakia appears as a white patch often found in or near an early carcinoma; mosaic leucoplakia and ground leucoplakia are discernible only by colposcopic magnification and indicate abnormal types of epithelial architecture. Colposcopic findings in stage 0 and early stage I carcinoma are much the same, and there is no specific finding to indicate malignant change. Some type of leucoplakia was found in about half of these early cases. The authors have correlated the history, gross appearance, colposcopic findings, results of cytological smear examination and biopsy reports of as many patients as possible among the 168 examined. Fifteen had obvious squamous-cell carcinoma; four patients had early recurrence of invasive cancer following irradiation therapy; 23 patients had atypical findings and are under close supervision; 123 patients had benign colposcopic findings. The authors have not diagnosed a single malignant lesion primarily by cytology. Detailed colposcopic reports are given on the 15 patients with squamous carcinoma of the cervix. In early cases and in cases of early local recurrence after radiation treatment this method may help to locate abnormal areas for biopsy when the cytological findings are suspicious without being gross. The authors consider that colposcopy will never replace the fundamental means of diagnosing cervical cancer and should be rated as a complementary measure to cytological examination. Histological interpretation still remains decisive with respect to therapy. The authors consider that colposcopy has stimulated their study of the normal cervix and its abnormal variations. It has furnished evidence that carcinoma of the cervix may begin in multicentric areas, and a wider acceptance of the value of colposcopy seems justified.

#### Cervical Carcinoma, Pelvic Exenteration and Longevity.

L. PARSONS AND M. TAYMOR (*Am. J. Obst. & Gynec.*, October, 1955) review 86 radical pelvic exenteration operations for advanced or recurrent carcinoma of the cervix. They had already been convinced of the value of the procedure, and the present report chiefly considers the trend in longevity. Indications for the operation were as follows: recurrence after irradiation, 70%; recurrence after Wertheim hysterectomy, 6%; primary treatment for patients with extensive disease, 24%. Complete exenteration was performed in 64 of the 86 patients. The authors consider that operability and the extent of operation can be

determined only on exploration of the abdomen. The emphasis of surgical approach is on cure, not palliation. In performing uretero-sigmoid anastomosis, the ureter is made to pass through a wide tunnel beneath the sero-muscular coat of the bowel. A left transverse colostomy is made above the uretero-sigmoid anastomoses, and the lower end of the sigmoid is brought out to the skin; this permits the descending and sigmoid parts of the colon to serve as a new bladder. The post-operative mortality rate was high; there were 24 deaths in 86 patients (28%). Mortality of such magnitude, in patients with advanced malignant disease, radiation reaction and kidney damage, is to be expected. However, the authors hope that better selection of cases and improved methods of dealing with the ureters will improve the overall survival rate. Sixty-three patients had exenteration and 20 died after the operation. Of those who survived the operation, 16 are still alive after two years. Nearly all of these 16 patients have returned to full activity and a reasonably normal social existence. Nine have had recurrent bouts of pyelonephritis, but such attacks are less frequent since transverse colostomy has been employed. Twenty-seven patients succumbed after leaving the hospital, 20 within the first two years. Among seven patients who lived for more than two years after the operation, four had distant recurrences and two died of renal complications. The authors state that if a patient can weather the surgical attack and leave the hospital alive, she has a 50% chance of surviving for two years and a 37% chance of living five years. The post-operative mortality rate among patients submitted to total exenteration was 34%, while that of partial exenteration was 9%. However, the advantage gained by the less extensive operation which preserves the rectum is thought to be dissipated by the effect on survival. The presence of secondary carcinoma in the pelvic lymph nodes at the time of operation is of grave prognostic significance. The authors noted that 60% of patients with extensive or recurrent carcinoma of the cervix had no involvement of lymph nodes at the time of operation. They consider that this factor undoubtedly makes the operation of exenteration feasible.

#### The Interposition Operation.

D. W. DE CARLE (*West. J. Surg.*, January, 1956) discusses the advantages and limitations of the Watkins-Wertheim interposition operation for vaginal prolapse by means of a study of 29 personal operations and a review of the literature. He states that there is no unanimity among gynaecologists on whether or not this operation deserves a place in pelvic surgery. The study of 705 such operations by Zachel and Fischer (1936-1950) showed a recurrence of the pelvic abnormality in over 20% of the cases, subsequent uterine bleeding in 10%, complications with fistulae in 10%, and in 1% to 2% a subsequent fundal carcinoma. Zachel and Fischer concluded that the operation of interposition should be abandoned. On the other hand a similar survey of this operation at the Johns Hopkins Hospital (1930-1948)

suggested that the interposition operation had a definite place in gynaecological surgery. All advocates of the operation agree that there are definite limitations and contraindications as well as advantages, and that the careful choice of patients is essential. The author lists three generally accepted indications for the operation: (i) the occurrence of a pronounced but uncomplicated cystocele; (ii) the presence of a well defined but moderate uterine prolapse; (iii) mild urinary incontinence. He considers that the first of these is by far the most important indication, and that operation in such cases gives the highest percentage of permanent cures. The age of the patient is important, and the author agrees that the interposition operation should be limited entirely to women past the menopause. Moreover, the uterus should be mobile, and normal as regards size and shape. The presence of fibroid tumours is a contraindication to operation unless they can be removed by myomectomy. The author stresses the point that the operation should never be performed if there is a suspicion of uterine carcinoma or questionable adnexal abnormality. Preliminary diagnostic curettage, biopsy of the cervix and examination of the bladder are recommended. He concludes that the operation has a definite place in pelvic surgery, particularly among elderly women with severe and uncomplicated cystocele. Good results are obtained when due regard is paid to the indications and limitations of the operation.

#### Urinary Tract Injuries in Obstetrics and Gynaecology.

R. C. BENSON AND F. HINMAN, JUNIOR (*Am. J. Obst. & Gynec.*, September, 1955) report a study of urinary tract injuries in obstetrics and gynaecology over a fifteen-year period at the University of California Hospital. They discuss the incidence of damage to the urinary tract in pelvic surgery and appraise the causes of such damage. Measures aimed at prevention, early recognition and operative cure are stated. There were 62 instances of major injury to the urinary tract among 6211 major surgical operations, which included 458 Caesarean sections and 137 radical Wertheim hysterectomies. Of these 62 accidental injuries 36 were of the ureter, 25 were of the bladder, and one was of the urethra. The ureteral injuries included marked stricture of the ureter (13), ureteral fistula (10), severed ureter (9) and ureteral occlusion (4). Ureteral injuries occurred usually during complicated and difficult dissections. Inadequate incisions and faulty operative technique contributed towards these accidents. The authors make the following suggestions as regards the prevention of ureteral injury: adequate pre-operative urological study and preparation of the patient, the insertion of ureteral catheters prior to difficult pelvic surgery, complete mobilization of the bladder from the cervix in total hysterectomy by the abdominal or vaginal route, the avoidance of undue traction and needless denudation of the ureter and the avoidance of mass ligation. Four danger zones in the course of the ureter and the blood supply of the

pelvic ureter are briefly described. The grave danger of these ureteral accidents lies in failure to recognize the injury and the danger of extravasated urine. Details of three deaths in the series indicate that prompt recognition of the injury may have saved the lives of two patients. Three surgical principles are stressed in the treatment of ureteral injuries during gynaecological operations: adequate drainage for the possible leakage of urine, the establishment of continuity of the urinary tract and splintage of the area of repair with an indwelling tube. The authors discuss the indications for deligation, anastomosis, decompression, purposeful ligation of the ureter and nephrectomy. Twenty-five bladder injuries in the series comprised laceration of the bladder (15), vesico-vaginal fistula (9), and vesico-abdominal fistula (1). Scarred tissues, the result of either previous surgery or radiation, poor exposure and faulty operative technique disposed towards bladder injury. The bladder is prone to be injured in abdominal surgery during incision of the parietal peritoneum, when the bladder is displaced downwards during total hysterectomy, during the dissection for the removal of a cervical stump and in the course of an extra-peritoneal Caesarean section. The authors state that prompt recognition of bladder injury is the essential feature of treatment. The injury was recognized and immediate repair effected in about half of the reported cases. Two urological principles are advised in treating bladder injuries: the site of repair must be adequately drained extraperitoneally, and the bladder itself must be drained. There were no obstetrical urethral injuries in the series reported. The reported case of urethro-vaginal fistula followed inept bladder catheterization ten days after vaginal repair. The authors describe and illustrate various technical details for the repair of accidental injury to the urinary tract during gynaecological operations.

#### Resuscitation of the Newborn Infant.

A. BLOXSON (*Anesthesiology*, January, 1955) presents a preliminary report of the treatment of five infants, suffering atelectasis and hyaline membrane disease, with a non-toxic detergent and hyaluronidase. Each patient showed rapid improvement when submitted to this aerosol therapy. The detergent was composed of 5% glycerine and 2% sodium bicarbonate with a non-toxic detergent in a 0.125% solution, to which were added 500 units of hyaluronidase for each 500 millilitres of solution. The author believes that in at least some atelectatic lungs of the newborn infant a cell-cementing substance, such as hyaluronic acid, exists. He therefore suggests the use of hyaluronidase to reduce the tissue barrier, which persists for approximately forty-eight hours. The detergent and sodium bicarbonate dissolve tenacious mucus, and extra moisture is carried to the terminal alveoli by the glycerine. The hyaluronidase dissolves the surface membrane holding the cells together and allows the detergent to reach the terminal portions of the lungs, where liquefaction of any tenacious mucus takes place.

## British Medical Association News.

### SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Royal Alexandra Hospital for Children, Camperdown, on June 23, 1955. The meeting took the form of a series of clinical demonstrations by members of the medical and surgical staffs of the hospital.

#### Rheumatic Fever.

THE INSTITUTE OF CHILD HEALTH presented a demonstration of rheumatic fever indicating age incidence, recurrence rate and ten-year prognosis in a group of children treated at the Royal Alexandra Hospital for Children between 1935 and 1954. Prophylaxis was stressed.

#### Congenital Toxoplasmosis.

DR. D. G. R. VICKERY showed a child, aged seven and a half months, who had been first examined at eleven weeks of age because his mother was worried about his eyesight and stated that the child's eyes wandered about aimlessly and he had no power of focusing his eyes. He had been born prematurely by one month, having a birth weight of five pounds four ounces. Although the delivery was normal, the baby had been cyanosed and exhausted and required resuscitation. He had thrived well. The mother had had an indefinite infection, diagnosed as colitis, at the third month of pregnancy, and pyelitis at the fifth month of pregnancy.

On examination of the child at eleven weeks of age, his bare weight was nine pounds. His nutrition was good. He was a fair-haired baby, crying normally, but constantly moving his head, rolling his eyes from side to side and not focusing. He seemed to hear and respond to his mother's voice. He had microphthalmos, with a large hydrocephalic type of head, the circumference being 16 inches. The fontanelle was wide open, but showed no tension. The pupils responded to light. There was no spasticity of limbs, and the heart, lungs and abdomen were normal. X-ray examination of the skull showed fine cerebral calcification. Examination of the eyes by Sir Norman Gregg revealed chorio-retinitis. The cerebro-spinal fluid was clear and contained 18 cells per cubic millimetre (all mononuclear cells), 80 milligrammes of protein per 100 millilitres and 660 milligrammes of chlorides per 100 millilitres; glucose was present; no parasites were demonstrated. The result of a dye test, both of the mother and of the baby, was positive for toxoplasma antibody in a dilution of 1:128. Examination of the blood revealed a haemoglobin value of 12.1 grammes per centum; the red cells were normal in size, shape and colour; the leucocytes numbered 4600 per cubic millimetre, made up of neutrophile cells 33%, lymphocytes 61%, monocytes 3% and eosinophile cells 3%.

The baby was treated with sulphadiazine "Dulcets" (0.3 gramme six-hourly for three days, then 0.15 gramme six-hourly for seven days) and pyremethamine ("Daraprim") (four milligrammes twice a day for two days, then four milligrammes daily for five days, a total dosage of 36 milligrammes). He now weighed 16 pounds 4 ounces and had thrived well. He held up his head with support. His eyes still moved around in a "searching" way as if "trying to focus". He smiled, heard and responded to his mother's voice. His head circumference was eighteen and one-eighth inches. The fontanelle was full, but not tense. There was no spasticity, and there had been no convulsions. An X-ray film taken by Dr. Voss on April 5, 1955, when compared with the previous skiagram, showed the same areas of calcification, but they appeared if anything to be slightly thinner; that suggested that some absorption of the calcium had occurred, but the changes were too slight to be definite.

#### Myeloid Leuchæmia.

Dr. Vickery also showed a baby, aged three months when admitted to hospital on April 14, 1955. He had been quite well until one month before admission to hospital, when it had been first noticed that he was pale. Two weeks before admission to hospital he had had an attack of bronchopneumonia treated with sulphonamides and penicillin. He had vomited the sulphonamides, and their administration had been suspended after two days. Since the illness he had been noticeably paler and was more easily tired than previously. His appetite had fallen off.

On examination he was found to be a pale child with a liver palpable two fingers' breadth and a spleen palpable one

finger's breadth below the costal margin. He had moderate enlargement of cervical, axillary and inguinal lymph nodes. The result of the Hess test was negative after ten minutes. Blood examination revealed an erythrocyte count of 2,110,000 per cubic millimetre, a haemoglobin value of 7.5 grammes per centum and a colour index of 1.16; reticulocytes made up 3% of the red blood cells, and nucleated red cells numbered 120 per cubic millimetre; the leucocytes numbered 4000 per cubic millimetre, made up of neutrophile cells 22%, lymphocytes 67%, monocytes 9% and eosinophile cells 2%. X-ray examination of the chest showed the heart and lung fields to be within normal limits. The results of cold agglutination tests were negative.

He was given a transfusion of 250 millilitres of packed cells, and on April 18 his haemoglobin value had risen to 13.6 grammes per centum.

A marrow puncture was performed on May 19 and showed the picture of acute myelogenous leuchæmia. On April 27 the patient developed a respiratory infection, which was treated first with penicillin and then with "Achromycin" for fourteen days. A chest X-ray examination on May 3 showed patchy consolidation in the middle lobe of the right lung. A blood count on April 29 showed the haemoglobin value to be 11.5 grammes per centum, and the leucocytes numbered 4000 per cubic millimetre, with neutrophile cells 18% and lymphocytes 20%. By May 3 the haemoglobin value was 9.0 grammes per centum, and the leucocytes numbered 1700 per cubic millimetre with 59% of neutrophile cells and 38% of lymphocytes.

Cortisone 50 milligrammes four times a day was given for two days and then reduced to 25 milligrammes four times a day; this was further reduced in seven days to 25 milligrammes twice a day. On May 7 "Aminopterin" two tablets twice a day was given for two days and then reduced to half a tablet (0.25 milligramme) twice a day. The haemoglobin value and white cell counts showed a temporary response, and on May 9 the haemoglobin value was 10.4 grammes per centum and the leucocytes numbered 4600 per cubic millimetre with 68% of neutrophile cells and 32% of lymphocytes. By May 19 the haemoglobin value was 7.3 grammes per centum, and the leucocytes numbered 2900 per cubic millimetre with neutrophile cells 2%, lymphocytes 74%, monocytes 6% and blast cells 18%. "Aminopterin" treatment was suspended, and a further 250 millilitres of packed cells were given. A full blood count on May 23 showed a haemoglobin value of 13.5 grammes per centum, and a leucocyte count of 10,000 per cubic millimetre, with 66% of neutrophile cells and 33% of lymphocytes. Administration of "Aminopterin" half a tablet twice a day was recommenced.

From that time until the patient's discharge from hospital on June 6, 1955, the blood picture remained normal. He was discharged from hospital with the following treatment: cortisone, twelve and a half milligrammes twice a day; "Aminopterin", half a tablet daily.

#### Tay-Sachs Disease.

DR. D. G. HAMILTON showed a boy, aged seventeen months, who since the age of nine months had gradually become less interested and less able to move and play and respond to stimulation of any sort. Examination showed marked mental retardation, marked physical incapacity and the red macular spot typical of Tay-Sachs disease. He was the last of a family of six. One previous child had died of the same disease at the age of eighteen months. One great-grandparent was Jewish.

#### Cat-Scratch Fever.

Dr. Hamilton also showed a boy, aged three years, who one month previously had developed mild fever and a faint red papular rash on his body and limbs. That had lasted for two days, and then a tender swelling developed in the left axilla. He had had a small sore on his left arm and a small vesicle on the back of the left hand. The tender mass in the axilla had persisted, but he had been well since the first few days of the illness. He lived close to a country abattoir and had the choice of approximately 30 cats for playmates.

The results of examination were negative except for a tender mass of glands in the left axilla and the healing scars of the small sore on the arm and the vesicle on the hand. Blood examination revealed an erythrocyte count of 4,580,000 per cubic millimetre, a haemoglobin value of 12.8 grammes per centum and a leucocyte count of 10,400 per cubic millimetre, with neutrophile cells 50%, lymphocytes 46%, monocytes 2% and eosinophile cells 1%. The Mantoux reaction was negative. The X-ray appearances of the chest

were normal. The result of a skin test for cat-scratch fever was positive.

#### Tuberculous Adenitis and Parotitis with Cyst Formation.

Another patient shown by Dr. Hamilton, a girl, aged three years, had in November, 1954, developed an abscess in the left cervical glands. That was incised, and pus was obtained. Because the wound failed to heal, she was referred to Sydney in January, 1955. The Mantoux reaction was positive and on X-ray examination the chest was clear. She was given streptomycin and isoniazid. The inflammation in the tissues surrounding the infected left cervical glands gradually subsided, and in May they were excised. Examination confirmed that the infection in them was tuberculous.

On March 2 a hard, painless, non-tender swelling of the whole right parotid gland developed without causing fever. Two weeks later the hardness and swelling of the upper half of the gland rapidly subsided, but a soft cystic swelling developed in front of the gland. That was aspirated through the mouth and found to contain thin fluid, a few pus cells and acid-fast bacilli. A sialogram showed that lipiodol injected up the parotid duct entered and remained in the cyst. The swelling of the lower half of the parotid gland gradually subsided. The cyst increased in size and tension and was aspirated through the mouth several times. Its contents were saliva with a high protein content indicating some persistent inflammation. No organisms had been found recently. The contents of the cyst could not be squeezed down the parotid duct.

The following surgical procedures were being considered: (i) excision of the cyst, (ii) permanent drainage of the cyst into the mouth, (iii) injection of a sclerosing agent into the cyst, (iv) denervation of the parotid to stop secretion.

#### Toxoplasmosis.

Dr. Hamilton's last patient, a girl, aged twelve months, had at the age of five months begun to take fits (massive myoclonic jerks). Examination of the child revealed that her head control was not quite good enough for her age, and she had slight flaccid weakness of the right arm and leg. There was a marked macular retinitis with impaired vision. X-ray examination of the skull showed extensive crescentic calcification, probably in the choroid plexuses, and some flecks of calcium in the posterior part of the right hemisphere. Electroencephalography showed a normal tracing from the right hemisphere, but high voltage slow waves from the left. The cerebro-spinal fluid contained 40 leucocytes per cubic millimetre and 60 milligrammes of protein per 100 millilitres. Her fits were much reduced in frequency and severity by "Mysoline". She was seriously mentally retarded and was developing hydrocephalus.

#### Atrial Septal Defect.

DR. D. STUCKEY and DR. G. BLAXLAND showed a girl, aged four years, who had been born after a normal pregnancy and labour. She had always been a poor eater and difficult to feed and had been slow to gain weight. No other symptoms were apparent. She was found on examination to be of slight build, with a normal pulse, a diffuse right ventricular impulse, a systolic murmur grade 2, maximal in the second and third left intercostal spaces, and a split second sound. Electrocardiography showed slight right ventricular preponderance. X-ray examination showed an enlarged heart, a prominent main pulmonary artery and well-marked pulmonary plethora. The child was considered to have an atrial septal defect. It was pointed out that operation would be available for that type of lesion in the near future.

#### Coarctation of the Aorta.

Dr. Stuckey and Dr. Blaxland then showed a boy, aged seven and a half years, who had undergone operation for coarctation of the aorta. His history was that his mother had been well during pregnancy and he had been well until the age of five years. From that time he had been always tired and complained that his legs ached and felt tired after running about at school. A heart murmur had been noted by the school doctor when the boy was aged six years. On examination he had been found to be underweight and undersized. His radial pulse had a full volume. His blood pressure was 160 millimetres of mercury, systolic, and 100 millimetres, diastolic. Femoral pulsation was barely palpable and was delayed. Collateral arteries were palpable in the axillae and around the scapulae, and a systolic bruit was audible over them. A strong left ventricular impulse was palpable. A systolic murmur, grade 4, was audible,

maximal in the region of the left second costal cartilage. Electrocardiography showed left ventricular preponderance. Angiocardiography showed some narrowing of the aorta just below the arch. Operation was performed in November, 1954, by Dr. E. S. Stuckey. The coarcted segment was resected, and continuity of the aorta was restored by end-to-end anastomosis. Post-operatively the boy was much improved and had lost all symptoms. The femoral pulses were now normal, and the blood pressure was 116 millimetres of mercury, systolic, and 60 millimetres, diastolic.

#### Patent Ductus Arteriosus in Infancy.

The third patient shown by Dr. Stuckey and Dr. Blaxland was aged two months. The child's mother had not been aware of any illness during pregnancy, but did not realize that she was pregnant until the thirty-fourth week. Labour was two weeks premature but uncomplicated. The baby was slow to breathe, and in the first few days of life was pale and listless and sucked poorly. Feeding had improved, but weight gain had been slow—the weight at birth was five pounds two and a half ounces and at one month was five pounds twelve ounces. On examination the child was found to have bilateral cataracts. The pulse was collapsing in type and of large amplitude. The blood pressure was 150 millimetres of mercury, systolic, with an unrecordable diastolic pressure. The cardiac impulse suggested left ventricular hypertrophy. A systolic thrill and long systolic murmur were present, extending into diastole, and maximal in the second left intercostal space. The haemoglobin value was 16 grammes per centum. The electrocardiogram showed left ventricular preponderance. X-ray examination showed an enlarged heart and plethoric lung fields. The child was considered to have a patent ductus arteriosus; in view of the poor weight gain and failure to thrive, operation would probably be necessary at an early date.

#### Exchange Transfusion.

DR. S. E. J. ROBERTSON presented a demonstration of apparatus used for exchange transfusion. He said that, the indications for exchange transfusion being present, the umbilical vein was usually available up to the age of forty-eight hours. After that period the saphenous vein must be entered just before it entered the femoral vein in the groin. The infant was placed in a warm cot and kept warm by means of a spot light. He was draped with sterile towels. The cord was cut cleanly across with a large-bladed scalpel two to three centimetres from the skin. Three vessels were visible: two arteries, which projected, were hard to the touch and were tightly closed; the vein was not so prominent and was usually oozing blood, depending on the degree of venous pressure. If the cord was very dry, it might have to be cut off flush with the skin, where the vein would usually be patent. The superior and inferior margins of the vein were then firmly grasped with mosquito forceps. That would render the cavity of the vein prominent and easy to enter.

Any clot seen in the lumen should be removed with fine dissecting forceps. The metal cannula of the assembled set, with the polythene catheter projecting two millimetres beyond its tip, was then inserted into the vein. It was then gently advanced, no force being used and the fact being remembered that the course of the umbilical vein in the cord was tortuous and roughly spiral. After the cord was traversed, the vein passed towards the head just beneath the skin for one or two centimetres. At that point there was often a valve, which could be best negotiated by grasping the cord and applying traction on it in the direction of the infant's pubis. The cannula was then held close against the infant's abdomen and advanced towards the head. It would be felt to slip in and take a course towards the centre of the infant's abdominal cavity and should be inserted to the hilt. Suction on the syringe would then produce blood. The cannula was held in with a piece of sterile tape tied around the cord and the exchange transfusion proceeded with.

The apparatus consisted of a Diamond-Allen exchange transfusion cannula, through which was passed a collapsible piece of plastic catheter two feet long. The proximal end of the catheter was connected to the first two-way stopcock by a Tuohy adapter, which made an airtight joint. The first two-way stopcock was connected to a rubber tube, which led to a bowl for discarded blood. The second was connected to an ordinary transfusion set without the drip chamber and with an infusion thermometer set into the tubing. The syringes used were all glass and 20 cubic centimetres in capacity. At least three should be available, as they tended to stick. There should also be a syringe containing calcium gluconate (10%) to counteract any hypo-

calcaemia resulting from the injection of large amounts of citrated blood. Another syringe should contain isotonic saline to clear the set before and after injecting the calcium gluconate.

The following difficulties were experienced: (i) Failure to find or cannulate the vein; that required patience, and up to thirty minutes might be necessary. (ii) Spasm of the vein with resultant difficulty in removing blood; the spasm was due to rough handling or to injection of blood which had not yet reached room temperature after being removed from the refrigerator; it could be dealt with by patience, blood being removed in one cubic centimetre amounts until the blood warmed and the spasm relaxed, or by pushing the plastic catheter through the cannula until it entered a portion of the vein not in spasm. (iii) Clots which were likely in the vein in infants over twenty-four hours of age; they could sometimes be removed by maintaining suction and slowly removing the cannula with the clot attached to the end. As far as the apparatus was concerned, spontaneous clotting would not occur in the catheter. Clotting often occurred at the junction of the distal two-way stopcock and the Tuohy adapter, and that joint should be inspected periodically.

#### The "Late" Anaemia of Haemolytic Disease of the Newborn.

Dr. Robertson then discussed the "late" anaemia of haemolytic disease of the newborn. He said that the infant with haemolytic disease of the newborn had his red cells coated with rhesus agglutinin derived from his mother. Exchange transfusion would remove most of the affected cells, but it was difficult to remove more than 80% without prolonging the exchange for a dangerously long period. The remaining original red cells would be largely destroyed in the first six weeks of life at a rate which would depend on their degree of sensitization. If also a negative balance was left during exchange transfusion to relieve excess venous pressure, a further lowering of the haemoglobin level would occur.

Dr. Robertson then presented a chart which showed the results of haemoglobin estimations carried out on 30 infants who had received exchange transfusion before they were forty-eight hours old. The first reading was taken on the day after exchange transfusion. The subsequent readings showed the tendency to fall to a minimum in the first two months, a level which might reach six grammes *per centum*. In the next three months the haemoglobin value rose to a normal level, the minimum normal level being considered to be 10 grammes *per centum*. A second chart showed more clearly the fall and subsequent rise of haemoglobin level in 12 of the patients.

Dr. Robertson said that during the period under consideration the infants were all closely watched. Apart from pallor they progressed normally. They sucked well, many being breast-fed alone. They had plenty of energy and a good loud cry. At the age of sixteen weeks they were holding their heads firmly erect. Their weight gains were normal. Minor illnesses occurred and followed the same course and required the same treatment as for infants with normal haemoglobin levels. At no time was simple transfusion considered to be necessary on clinical grounds. Some of the infants had reached the age of twelve months at present. At that age they were normal in weight, were pulling up in their cots and were crawling. It was considered that no ill effects had occurred from the anaemia. It was also considered that simple transfusions to increase a haemoglobin level would produce only a temporary rise in haemoglobin level and would have to be repeated, and that they would produce no clinical benefit. It was considered that they were unnecessary and added risk of transfusion reactions.

#### Kernicterus in the Newborn.

Dr. Robertson then showed two children who had been suffering from kernicterus of the newborn.

The first was a boy, born on October 28, 1954. He was the second child, the first having been normal in all respects from birth onwards. His mother had received no transfusions or injections of whole blood. During pregnancy she had received a course of injections for hay fever. She was known to be rhesus negative, and her anti-D agglutinin titre at the thirty-sixth week of pregnancy was 256 in saline and 256 in albumin. Spontaneous labour commenced at term, and after five hours a normal delivery was effected. The umbilical cord was clamped immediately. The infant was very pale and collapsed, but no jaundice was seen. Cutaneous hemorrhages were present on the face. The liver and spleen were palpable to the level of the umbilicus.

He weighed seven pounds eight ounces. Examination of the cord blood showed a very strongly positive result from the Coombs test, a haemoglobin value of 4.6 milligrammes *per centum*, a reticulocyte level of 22% of red cells, a nucleated red cell level of 76% of all nucleated blood cells and a serum bilirubin level of 11.5 milligrammes per 100 millilitres.

Exchange transfusion was commenced forty-five minutes after birth, being given through the umbilical vein, and was completed in three hours. A total of 640 millilitres of blood was removed and replaced by 600 millilitres in amounts of 20 millilitres; a negative balance of 40 millilitres was maintained throughout. Calcium gluconate (10%) was injected in amounts of one millilitre after each 100 millilitres of blood injected. No difficulty was experienced apart from venous spasm, which made the removal of blood difficult at times. Venous blood removed at the end showed a bilirubin level of five milligrammes *per centum*. The infant's condition at the end was greatly improved; he had a vigorous cry and active movements.

Jaundice began to appear twelve hours after birth, and twenty-four hours after birth it was moderate in amount. The infant appeared well, the haemoglobin value being 12.8 grammes *per centum* and the serum bilirubin level seven milligrammes per 100 millilitres. Forty-eight hours after birth the infant's condition was fair, but there were definite signs of kernicterus, in that the head was retracted, there was a portion of sclera visible below the upper eyelid, there was vertical nystagmus, and the fingers were hyperextended with tightly adducted thumbs. The haemoglobin value was 12.3 grammes *per centum* and the serum bilirubin level 12 milligrammes per 100 millilitres. Another exchange transfusion through the saphenous vein was contemplated, but decided against in view of the safe level of bilirubin and the infant's poor condition.

Little change occurred during the next week. Bottle feeding was carried out, but sucking was managed poorly and vomiting was frequent. There seemed to be some neuro-muscular disturbance of swallowing. The Moro reflex was incomplete, the jaundice remained moderate, the arms were held in unusual positions, and muscle tone was increased. Sucking and swallowing then improved, and breast feeding was established at the age of nine days. The child was discharged from hospital at the age of ten days, weighing six pounds four ounces, with a haemoglobin level of 11.9 grammes *per centum*. His jaundice had disappeared, as had his skin hemorrhages. Both arms were held flexed at the elbows and wrists with pronated forearms. The thumbs were tightly adducted, and all fingers were flexed, except the left index, which was extended at the metacarpophalangeal joint. Both legs were held flexed at the knees and dorsiflexed at the ankles. The toes were held extended at the metatarsophalangeal joints and flexed at the interphalangeal joints. Coarse jerky movements of the left arm had been noticed. The extensor tone of all joints was increased.

When examined next at the age of three weeks the child was feeding well at the breast and had regained his birth weight. No abnormal movements were noticed, and no abnormal attitudes were seen except clenching of the fists with adduction of the thumbs. The Moro reflex had returned. At the age of sixteen weeks he weighed 14 pounds and was feeding well. He was holding his head firmly erect approaching a rattle, holding a rattle momentarily with both hands, smiling and laughing spontaneously. Adduction of the thumbs was no longer present. When disturbed he extended legs and arms, pronated his feet and extended his fingers. Muscle tone in the ankles and wrists seemed increased. At the age of twenty-eight weeks he weighed 19 pounds. He was sitting alone, grasping toys in both hands, transferring them from hand to hand and putting his toes in his mouth. He still tended to extend his legs and pronate his feet when excited, but otherwise exhibited no abnormal movements or attitudes.

Dr. Robertson commented that the baby had had a very severe degree of haemolytic disease of the newborn. Prompt exchange transfusion had prevented an early death, but had not prevented damage to the *corpus striatum* with definite signs of kernicterus. In view of the not greatly increased serum bilirubin level at twenty-four hours, that was hard to explain because of the theory that kernicterus did not occur without a high bilirubin value. Probably a second exchange transfusion was indicated, but it was doubtful whether the baby would have survived it. After presenting such a picture in the neonatal period it was confidently expected that as the infant grew older he would show the later manifestations of kernicterus, such as intermittent pyrexia and sweating, head retraction, feeding

difficulty, failure to thrive, abnormal attitudes and movements, and failure to carry out developmental steps at the right ages. That had not been so. He had shown constant improvement, losing his earlier signs, and had progressed like a normal infant.

The end of the story had not yet been told, but it seemed probable that the infant would not be affected by any of the severe manifestations of kernicterus.

The other patient was a boy, born on November 26, 1954. It was his mother's fifth pregnancy. Her first had been a tubal pregnancy in 1946, when the tube had ruptured. During operation she was given a blood transfusion, the rhesus grouping of the donor's blood being unknown. In 1947 she had a miscarriage. In 1949 she was delivered of a normal infant, who had no jaundice or pallor and was now normal. In 1951 she became pregnant again, but the fetal movements ceased six weeks before term, and she was delivered of an infant dead from *hydrops foetalis*. She had had no blood transfusions other than the one previously mentioned and no known injections of whole blood.

The fifth pregnancy was normal, and her anti-D agglutinins were present in a titre of 0 in saline and 64 in albumin at the thirty-fifth week. She had a spontaneous labour at term and was normally delivered after eight hours. The cord was clamped at once. The infant was a male and was born apnoeic and very pale, with poor tone and covered with abundant yellow vernix. The liver and spleen were grossly enlarged, and haemorrhages soon appeared in the skin of the face. Examination of the cord blood showed a haemoglobin value of 7.3 grammes per centum; nucleated red cells made up 80% of the nucleated blood cells and reticulocytes 12% of red cells, and the serum bilirubin content was 13.6 milligrammes per 100 millilitres. The result of a direct Coombs test was strongly positive, and the infant's blood was rhesus-positive. Jaundice began to appear thirty minutes after birth.

Exchange transfusion with Group O rhesus-negative female blood was commenced one hour after birth. After catheterization of the umbilical vein, the infant's venous pressure was found to be greatly raised. Greater amounts of blood were removed than were put in, until the venous pressure was reduced to normal. That entailed the building up of a negative balance of 60 millilitres, with noticeable improvement in the infant's condition. Equal amounts of 20 millilitres were then injected and removed until 620 millilitres had been put in and 680 millilitres taken out, the procedure lasting two hours. Calcium gluconate (10%) in amounts of one millilitre was injected after each 100 millilitres of blood had been put in. The haemoglobin value in venous blood taken at the end was 8.4 grammes per centum and the serum bilirubin content eight milligrammes per 100 millilitres. The infant was in much better condition after the exchange transfusion.

During the next twelve hours the jaundice increased and the serum bilirubin content became 20 milligrammes per 100 millilitres. Exchange transfusion was repeated twenty-four hours after birth, the right saphenous vein being used at the groin; 500 millilitres were put in and 500 millilitres taken out. During the next few days the infant was in poor condition, with head retraction, a high-pitched cry, extended legs, fists clenched and thumbs adducted. Jaundice persisted, and the liver remained greatly enlarged. The haemoglobin value was 16 grammes per centum on the seventh day. He improved from then on, becoming more vigorous, and breast feeding was established. The Moro reflex remained incomplete, and he kept his left arm stiff with an adducted thumb. Jaundice slowly faded, and his spleen became smaller, but his liver remained enlarged. He was discharged from the obstetric hospital at the age of eighteen days, sucking well at the breast, gaining weight and with a haemoglobin value of 13 grammes per centum. He was still slightly jaundiced, and his liver was enlarged downwards four centimetres.

At the age of six weeks he was admitted to hospital with a history of spontaneous bruising for eight days, bleeding from the mouth for thirty-six hours and black stools. He was still jaundiced, with a liver enlarged four centimetres. His haemoglobin value was 4.0 grammes per centum and his serum bilirubin content 5.6 milligrammes per 100 millilitres. He was thought to have a prothrombin deficiency, but venous blood could not be obtained for a complete investigation. A small transfusion stopped the bleeding tendency and restored the haemoglobin value.

At sixteen weeks of age he had no jaundice, but his liver was the same size. He was feeding well, gaining weight, holding his head erect, tentatively reaching for things, holding objects in his hands for short periods, lying sym-

metrically, kicking his legs, smiling and laughing. There was still slight adduction of the thumbs, he tended to show a border of sclera above his irises, and he tended to use his left hand less than his right. At twenty-eight weeks of age he was of normal weight with no liver enlargement. He was sitting alone. He tended to keep his left hand clenched and used it less than his right.

Dr. Robertson said that the patient illustrated several important points. The first was that a very severely affected infant could be saved if exchange transfusion was carried out early and adequately, and another exchange was carried out if the serum bilirubin rose to dangerous levels. The second was that much more blood could be removed than was put in if the venous pressure was extremely high; the ensuing anaemia was not dangerous, but to leave an infant with a high venous pressure might cause death in a few hours. The third point was that some infants severely affected with haemolytic disease of the newborn might develop persistent liver disturbance with prolonged jaundice, hepatomegaly and a coagulation defect. The cause of that might be inspissated bile obstructing the bile ducts. The last point, also illustrated by the first patient, was that neurological disturbances prominent in the first weeks after birth might not persist, and that a bad prognosis should not be given until after a prolonged period of observation.

#### Subdural Haematoma.

Dr. T. Y. NELSON showed three patients who had been suffering from subdural haematoma.

The first, a boy, aged two years, had a history of being struck by a truck and knocked unconscious on December 6, 1954. X-ray films taken at the time had shown fracture of the parietal and occipital regions. On arrival at the Royal Alexandra Hospital for Children he was semiconscious, was hypotonic in the left limbs and had a Babinski response on the left side with a doubtful Babinski response on the right; the left abdominal reflexes were absent. He had much swelling and bruising over the right parieto-occipital region with a slight leak of cerebro-spinal fluid from the right ear. He was given sulphonamide drugs two-hourly, ear toilet was performed, and by the next day he was observed to be fully conscious but irritable. The irritability persisted for several days, cerebro-spinal fluid discharge from the ear ceased, and the hypotonia in the left limbs decreased and disappeared. The only persisting central nervous system sign was the Babinski response on the right side. On December 16 meningitis was considered a possibility. He was submitted to lumbar puncture, and penicillin was given. However, the cerebro-spinal fluid was clear.

X-ray examination of the skull on December 12 showed a comminuted depressed fracture involving the right parietal and occipital bone and extending from the vertex to the base; the parietal and coronal sutures were also partly separated. On December 16 no abnormality was detected in the cerebro-spinal fluid. On December 20 no abnormality was detected on X-ray examination of the legs and pelvis. On December 30 the electroencephalographic record was reported as "consistent with cerebral contusions on the right side, but a subdural haematoma is also likely". Serial tracings were suggested.

After four weeks in hospital his condition was very good, and he was allowed to go home with instruction to report back at a later date.

Two weeks after discharge from hospital he was readmitted with the diagnosis of meningitis. While he was at home it had been noted that clear watery fluid was discharging from the nose. On his admission to hospital lumbar puncture was performed and showed turbid fluid with 5400 leucocytes per cubic millimetre, 97% of which were polymorphonuclear cells. The meningitis was controlled by means of antibiotic drugs, and the rhinorrhoea ceased.

On March 16, 1955, an attempt was made to find the meningeal fistula which was presumed to have caused the rhinorrhoea. A bilateral frontal bone flap was turned down and the dura opened on both sides. No definite perforation in the region of the cribriform plate could be seen on either side. On the right side, however, the olfactory nerve was atrophic, and a piece of "Gelfoam" was packed into that area. It was noted that in the upper part of the operative field there was the margin of a large subdural haematoma, which had evidently extended forward from the fracture site. The dura was closed and the bone flap wired back into its position.

On May 10 operation was undertaken to remove the subdural membrane. A large bone flap was turned down, extending posteriorly to the parieto-occipital area, which was the site of the small depressed area in the long fracture

line. An extensive subdural membrane was removed. It was then noted that there was considerable absorption of bone in the lowermost part of the fracture line. When the thinned-out edges of the bone were removed, it was found that the dura was deficient and a condition of meningeal cicatrix was present. Most of the dural defect was covered with a piece of *fascia lata*, and it was thought wise to terminate the operation at that stage owing to the child's unsatisfactory condition.

On June 1 the wound was reopened and the dural defect further explored. That necessitated removal of a fairly wide area of bone. The remainder of the dural defect was covered with polythene film. At a later date the cortical scar would be removed.

Dr. Nelson said that in retrospect it seemed likely that the meningitis arose from the damaged area in the mastoid region. The rhinorrhoea was probably due to a small perforation in the cribriform plate, which had sealed over and was not evident at operation.

The second patient, a male infant, had been admitted to hospital on March 22, 1955, at the age of five days. He had been born on March 17 after a difficult instrumental delivery. He did not suck well and was irritable. Lumbar puncture was performed and showed blood-stained fluid. On admission to hospital he had a full fontanelle, external strabismus and a dilated and non-reacting right pupil. A Grade 2 systolic murmur was audible at the cardiac apex. Bilateral subdural tap was performed with negative results on both sides. On the right side, however, some old blood was seen to flow from the needle puncture wound after the needle had been withdrawn. That finding, taken in conjunction with the clinical signs, was so suggestive of subdural haematoma that on March 30 a right parietal burr-hole was made. That disclosed a subdural haematoma with early membrane formation. On April 6 craniotomy was performed, and a subdural haematoma extending from frontal to occipital poles was removed. Post-operative progress was satisfactory, except for difficulty in feeding; for three weeks it was necessary to resort to tube feeding. The right pupil remained fixed and non-reacting. He was discharged from hospital in good condition, feeding well and maintaining a steady gain in weight. The right pupil was still dilated and did not react to light.

The interesting features of the case were the negative result from a subdural tap in the presence of a subdural haematoma and the almost unequivocal sign of third nerve paralysis on one side.

The third patient, a boy, aged twelve years, had been quite well until two weeks before admission to hospital, when, after a boxing bout, he had commenced to vomit. He had been punched over the right eye and right side of the face. The vomiting ceased after four days, but was associated with occipital headaches, which continued up till the time of admission to hospital. Two days before admission he had developed diplopia when looking to the right side. On admission to hospital the patient had severe diplopia, absence of right abdominal and cremasteric reflexes, a diminished knee jerk on the right side and a suggestion of slight blurring of the right optic disk. He was examined in consultation by Dr. Nelson on March 19, 1955, when observation and further tests were recommended. Headache continued, and vomiting recurred and became more severe after a few days, so that Dr. Nelson performed a pneumoencephalographic examination on March 30. Examination of the cerebro-spinal fluid, X-ray examination of the skull, blood count and microscopic examination of the urine showed normal results. The blood urea content was 46 milligrammes per 100 millilitres. The following reports were made on electroencephalograms: on March 23, "the left side lower amplitude suggests that subdural haematoma must be excluded"; on March 29, "this record shows marked deterioration; the findings are consistent with a left-sided subdural or extra-dural haemorrhage". Pneumoencephalography showed "a marked shift to the left of the ventricular system, with compression of the right ventricle". In view of the possibility that the shift was due to a tumour, right common carotid arteriography was performed on April 1. The result was unsatisfactory, but there appeared to be no upward or downward displacement of the vessels filled. By April 4 the boy's vomiting had subsided, but papilloedema had increased, being about two dioptres in the right eye and somewhat less in the left. On April 6 a burr hole through the right parietal bone revealed a subdural haematoma, which was partially removed. At craniotomy on April 13 a large subdural haematoma was removed from the right side. The post-operative progress was satisfactory, and when discharged from hospital the patient had no abnormal signs and his diplopia had almost disappeared. Microscopic examination of the haematoma

revealed a fibrovascular membrane on one aspect with active organization of the blood clot occurring from that membrane.

It was pointed out that the head injury in this case was not sufficient to cause unconsciousness, and symptoms did not develop for some days. That might cause confusion in some cases, as the symptoms due to tumour might first cause serious concern after an injury.

The patient was later readmitted to hospital for a follow-up pneumoencephalogram. He had been fairly well since discharge from hospital, although he had suffered from occasional headaches and a rather painful right foot. Pneumoencephalography was performed on May 11; the X-ray films showed that the cerebral shift previously present had now disappeared and that no other abnormality was present. The cerebro-spinal fluid was normal.

#### Left Inguinal Hernia: Adenomatous Polypus of Colon.

Dr. J. STEIGRAD showed a boy, aged three years, who when admitted to hospital in April, 1955, had had a lump in the left groin for seven months. It had been enlarging slowly and was frequently tender. Three months prior to admission to hospital he had commenced to pass dark blood *per rectum*, and bleeding had recurred at intervals of two to three weeks since. Left inguinal herniotomy was performed under "open" ether anaesthesia, and a lipoma of the cord was excised. Oral administration of phthalylsulphathiazole was commenced two days later, with subsequent removal of an adenomatous polypus of the colon. Convalescence was uneventful.

A previous barium meal X-ray examination had shown a polypus approximately two centimetres in diameter in the descending colon, three inches distal to the splenic flexure. The result of a Mantoux test was negative in a dilution of 1:1000. The pathologist gave the following report on the histopathology of the polypus: "The structure is that of a typical adenomatous polyp, the lining of the glands being of a tall columnar mucus-secreting type. The surface is extensively ulcerated and a thick layer of granulation tissue covers the entire polyp. Polymorphs and plasma cells are the predominating inflammatory leucocytes, but eosinophils are also fairly numerous. No malignant alterations found. Diagnosis: Benign, inflamed, adenomatous polyp."

#### Pectus Excavatum.

Dr. Steigrad then showed a girl, aged seven years, who had been admitted to hospital in February, 1955, with the history that her mother had first noticed a deformity of the child's chest at the age of one year. That had steadily increased, but apparently had caused no significant symptoms. Dr. Steigrad resected the involved costal cartilages and performed a wedge osteotomy of the upper part of the sternum. For six days paradoxical respiration was noticeable in the region of the sternum, but that disappeared spontaneously. Four weeks after operation the child was very well, and the deformity was much less.

#### Recurrent Left Parotitis.

The next patient shown by Dr. Steigrad was aged five and a half years. The child had been an in-patient on three occasions suffering from recurrent left parotitis. On the first two occasions *Streptococcus viridans* had been grown from the discharge from Stensen's duct, and the treatment given had been dilatation of the duct and instillation of penicillin. On the third occasion only the pneumococcus was grown, and again crystalline penicillin, 5000 units daily, was instilled into the duct. Improvement was slow, but by the fifth day of treatment the swelling and tenderness had disappeared. Sialograms taken on two occasions demonstrated the development of sialectasis, which was attributed to chronic infection.

#### Burns of Trunk and Limbs, with Curling's Ulcer.

Dr. Steigrad's last patient was a girl, aged five years, who had received first and second degree burns of the trunk and limbs (25% of the body surface) after playing with a box of matches when three years old. She was shocked on admission to hospital, and intravenous fluid therapy was administered. Two days after her admission to hospital the child had a small haematemesis, followed by repeated haematemesis and the passing of melaena stools throughout the following week; during that time she received a total of 500 millilitres of serum, 500 millilitres of packed cells and 2675 millilitres of whole blood, together with infusions of saline and dextrose. The burns were dressed with *tulle gras* and pressure dressings. Split-skin grafts were applied to the burnt areas in successive stages, and skin from the

child's father was used for temporary grafting of some areas. The homografts healed well, and secondary infection was controlled by the use of "Chloromycetin" dressings applied locally, together with courses of intramuscularly administered penicillin and streptomycin and orally administered "Chloromycetin" and "Aureomycin". The child's subsequent progress had been satisfactory, and no contractures had occurred.

#### Benign Flexiform Neurofibroma of Arm.

Dr. E. H. GOULSTON showed a child, aged ten years, who had had a small lump on the medial aspect of the left arm present for six months and increasing in size; it was not painful. Numbness and weakness of the fingers of the left hand had been present for one month. The child's only previous ailments had been measles and chickenpox. A paternal aunt and uncle had had pulmonary tuberculosis, the maternal grandmother had had carcinoma of the stomach, and a maternal uncle had had a "massive tumour" of the left thigh of unknown aetiology, treated at Guy's Hospital, London.

Examination of the child revealed a firm, non-tender, non-pulsating mass extending along the medial side of the left arm into the axilla. No sensory or motor nerve changes were evident in the left arm. Otherwise no physical abnormality was detected. A blood count revealed a haemoglobin value of 14.4 grammes per centum and a leucocyte count of 9000 per cubic millimetre made up of neutrophilic cells 55%, lymphocytes 40%, monocytes 1% and eosinophilic cells 1%. The result of a Mantoux test was negative at a dilution of 1:1000. Radiologically the chest, humerus, scapula and lateral two-thirds of the left clavicle appeared normal. At operation a multiple ramifying firm tumour was found within the triceps and other muscles, extending upwards towards the axilla, with small projections running into adjoining muscle tissue. The pathologist described it in the following terms:

**Gross:** A firm spider lobe tissue weighing 15G. The legs of the growth can be seen to merge at the centre to form a thick firm mass, while at the periphery continuity with normal nerves can be established.

**Microscopic:** The transition of normal nerve into neurofibromatous tissue is clearly visible with axonal structures undergoing considerable diminution and Schwannian tissue proliferating.

**Diagnosis:** Benign-plexiform neurofibroma.

On the day after the initial operation the child developed paraesthesia of the fifth finger of the left hand. That subsided. Two weeks later a further operation was performed for excision of the tumour mass in the left forearm via the anterior aspect; a tumour mass six to eight inches long was excised. A further two weeks later the remainder of the tumour tissue present in the left arm was excised from the elbow upwards and divided where the tumour tissue continued into the axilla. Galvanic testing prior to the third operation had shown that the third and fourth left lumbricals and interossei had shown reactions of degeneration. Other muscles of the arm had given a normal reaction.

Post-operatively the child had an ulnar nerve weakness on the left side and was given physiotherapy for reeducation of muscles. Under that regime the weakness subsided, and functional return indicated that the tumour mass could not have involved the ulnar nerve.

#### Neuroblastoma.

Dr. Goulston's next patient, a child, aged twenty-one months, had been brought to hospital with the history that a lump had been present in the left lumbar region for four months; it had been increasing in size during that time and had always been hard. Examination of the child revealed a raised, firm, slightly fluctuant swelling rising beneath the skin of the left lumbar region; it was apparently not tender. The Mantoux reaction was negative at a dilution of 1:1000. Blood count revealed a total of 14,000 leucocytes per cubic millimetre, made up of neutrophilic cells 38%, lymphocytes 43% and eosinophilic cells 12%. The blood sedimentation rate was eight millimetres in the first hour. X-ray examination of the chest, long bones and skull showed no abnormality. The following report was made on an excretion pyelogram: "There is scoliosis of upper lumbar spine in region of left kidney. Both kidneys excrete opaque medium. The pelvis of right kidney is considerably larger than the left. None of the minor calyces on the right side has been demonstrated. The left pelvi-calyceal system has been displaced forwards and medially. X-ray evidence suggests: (1) Pelvic hydronephrosis of right kidney. (2) Displacement of left kidney due to intrinsic pressure." Biopsy of the lump was per-

formed on February 8, 1952. The mass involved the left sacro-spinal muscle. The pathologist gave the following report on the specimen: "A highly cellular growth together with bundles of fine fibrils. Nuclei are hyperchromatic with only slight variation in size and configuration. Diagnosis: Neuroblastoma—probably metastatic deposit." On February 18 presacral pneumography was attempted without success.

After consultation with the radiotherapist, deep X-ray therapy to the mass in the lumbar region was commenced on March 23 and continued until March 30. During irradiation the leucocyte count fell to between 2000 and 3000 per cubic millimetre. A blood count on April 1 showed a haemoglobin value of 9.5 grammes per centum and a leucocyte count of 2100 per cubic millimetre, made up of neutrophilic cells 32%, lymphocytes 34%, monocytes 4%, eosinophilic cells 28% and basophilic cells 2%.

The child's general condition on discharge from hospital on April 1 was only fair. The swelling was smaller but still evident, and a mass was palpable on the left side of the abdomen.

#### Wilms Tumour of the Right Kidney.

Dr. Goulston's last patient was a girl, aged four years. She had had the following presenting symptoms: distended abdomen, "always present" (according to the mother) but increasing in size; abdominal pain, recurrent over the previous six weeks; malaise and lethargy for two weeks; prominence of the veins in the abdominal wall. Mumps had been her only previous illness. She had been born by Caesarean section, with a birth weight of five and a half pounds at eight months' gestation; she had gained weight readily and fed well. She weighed two stone eleven pounds on admission to hospital. She was a well-nourished child with a protuberant abdomen and prominent superficial veins coursing over it. A large hard tender mass occupied the right and left hypochondria and epigastrium and extended downwards across the mid-line below the umbilicus and into the right lumbar and iliac regions. She had a temperature of 100° F., but no other abnormal physical findings. Excretion pyelography showed that both kidneys excreted opaque medium; there was a large space-occupying lesion in the upper pole of the right kidney. X-ray examination of the chest showed a rounded opacity situated anteriorly in the right lung apparently in the middle lobe; its appearance suggested neoplastic metastasis. Blood examination showed a haemoglobin value of 10.9 grammes per centum and a leucocyte count of 12,000 per cubic millimetre, made up of neutrophilic cells 61%, lymphocytes 32%, monocytes 5%, eosinophilic cells 1% and basophilic cells 1%.

Because of the presence of probable pulmonary metastasis laparotomy was deferred, and after consultation with the radiotherapist irradiation of the abdomen and chest with deep X-ray therapy was commenced on January 27, 1955. After that the child developed ascites, which subsided over the next two weeks, and paracentesis was not performed. The abdominal tumour decreased in size, and progress chest X-ray examination on February 6 showed that the round right basal mass was smaller than previously.

Whilst she was receiving irradiation the child's general condition improved, and the leucocyte count fell to 3400 per cubic millimetre, made up of neutrophilic cells 82%, lymphocytes 10%, monocytes 3%, eosinophilic cells 2% and basophilic cells 3%.

By February 24 the child's condition had improved considerably, and after a further week of irradiation of the chest, operation was performed on March 8. At operation a right kidney with a normal lower pole was found; the upper pole was represented by scarred tumour tissue densely adherent to the liver, posterior abdominal wall, inferior vena cava and hepatic flexure of the transverse colon. Dissection of the scarred mass from those structures was performed, and the mass removed.

During operation the child was given blood transfusion, and post-operatively she required intravenous infusion of serum. By March 10 the child had recovered from the operation effects.

On March 15 irradiation was resumed, and X-ray examination of the chest on March 18 showed that the shadow previously present had disappeared, and the lung fields were normal. Despite the administration of pyridoxin the child commenced to vomit frequently on March 24, and intravenous therapy was necessary to maintain her hydration. Deep X-ray therapy was suspended. Afterwards the child improved slowly, and oral feeding was tolerated. Blood examination on April 5 prior to her discharge from hospital showed a haemoglobin value of 10.8 grammes per

centum and a leucocyte count of 7000 per cubic millimetre, made up of neutrophilic cells 83%, lymphocytes 7%, monocytes 9% and eosinophilic cells 1%. The pathologist made the following histopathological report on the tumour:

**Gross:** Tumour weighs 325G and measures  $9 \times 9 \times 7.5$  cm. Divided adhesions are evident over capsular surface and cut surface shows largely necrotic tissue.

**Microscopic:** Though much of tumour tissue is replaced by hyaline connective tissue and necrotic tissue infiltrated by old and recent blood there are areas of viable tumour still present. The separate specimen sent as possible adrenal tissue is largely structureless but appears to be altered tissue rather than adrenal gland.

**Diagnosis:** Wilms tumour showing extensive irradiation effects.

The child attended the follow-up clinic on June 2. The mother stated that the child had been eating well (but had not been weighed). She was active, walking and riding a bicycle. Her abdominal girth was twenty-five and a half inches around the umbilicus, and her abdomen still appeared distended.

Further X-ray examination of the chest was carried out and the following report was made:

There is a rounded opacity towards each axillary region; others, less well defined, are present in the left infraclavicular area. There is also veiling at both apices. X-ray evidence is of secondary deposits with pleural reaction.

(To be continued.)

## Medical Societies.

### AUSTRALASIAN CARDIAC SOCIETY.

The annual general meeting of the Australasian Cardiac Society was held at Wellington, New Zealand, on March 26 and 27, 1956.

The following office-bearers were elected: **President:** Dr. J. Kempson Maddox. **Chairman:** Dr. E. H. Roche (New Zealand). **Chairman-Elect:** Dr. Ellis Murphy. **Honorary Secretary and Treasurer:** Dr. J. M. Gardiner. **Members of Council:** Dr. C. R. Burns (New Zealand), Dr. Cyril Fortune, Dr. E. F. Gartrell, Dr. J. H. Halliday, Dr. H. B. Kay, and Professor F. H. Smirk (New Zealand). **Member of Council of International Society of Cardiology:** Dr. J. Kempson Maddox.

Dr. T. E. Lowe was appointed delegate to the second European Congress of Cardiology, to be held in Stockholm on September 10 to 14 of this year. Dr. A. E. Doyle, at present in London, is contributing.

The President, Dr. J. Kempson Maddox, was appointed to represent the Society at the Organizational and First Scientific Conference of the proposed Asian-Pacific Society of Cardiology, which was held in Manila from April 17 to 21, 1956. This conference was sponsored by the Philippine Heart Association, "for the purpose of establishing a regional society of the countries of Asia and Oceania, in accordance with the organisational plans of the International Society of Cardiology". The President of the International Society of Cardiology, Dr. Paul D. White, was present at the conference, and delivered the annual Ricardo D. Molina Lecture.

At the scientific meeting the following papers were presented: "Subendocardial Infarction: An Autopsy and Electrocardiographic Study", Dr. E. H. Roche; "Hemodynamics of Constrictive Pericarditis", Dr. J. K. Maddox, for Dr. B. Sinclair Smith and Dr. K. Cotton; "The Circulatory Effects of Rauwolfia Alkaloids, Experimental and Clinical", Dr. E. G. McQueen; "Anomalies Associated with Aortic Coarctation", Dr. B. Sinclair Smith and Dr. J. K. Maddox; "Coarctation of the Aorta: A Clinical and Post-operative Study", Dr. Rowan Nicks; "The Diagnosis and Choice of Surgical Treatment in Some Less Common Forms of Cyanotic Congenital Heart Disease", Dr. J. B. Lowe; "Electrocardiographic Changes following Acute Blood Loss and Their Response to Trinitrin", Dr. Ian Prior; "Case Report: Fibrosarcoma of Pericardium", Dr. John Halliday; "Some Aspects of Aortic Stenosis", Dr. John Halliday; "Surgical Approach to Aortic Stenosis", Dr. Douglas Robb, C.M.G.; "Phonocardiography in the Assessment of Mitral Valve Disease", Dr. J. M. Gardiner; "Heart Disease Asso-

ciated with Malignant Argentaffin Tumours", Dr. David Hay.

A demonstration of clinical cases was arranged by Dr. C. R. Burns. Cases included aortic stenosis, coarctation of the aorta, ventricular septal defect, Ebstein's disease and coronary arteritis. There was also a demonstration of pathological specimens of interest arranged by Dr. J. O. Mercer and Dr. Stephen Williams.

The 1957 annual meeting of the Society will be held in Brisbane at a date to be fixed.

## Out of the Past.

*In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.*

### WHEN DOCTORS DIFFER.<sup>1</sup>

[From the *Australian Medical Gazette*, January 30, 1869.]

A COMMISSION composed of the following medical gentlemen was appointed by the Chief Secretary, viz., Dr. McCrae, Dr. Motherwell, Dr. Pugh, Dr. Thomas, Dr. Barker, Dr. Crooke, Dr. James, Dr. Stewart, to inquire into and determine the nature of the disease of four patients now under treatment at the Immigration Hospital Bourke St. West.

The Commission met at 4 p.m. on Saturday Jan 9, 1869. Dr. McCrae took the chair. After each gentleman had inspected the cases it was moved by Dr. Thomas and seconded by Dr. Pugh "That each member be requested to state, without comment, the nature of the disease, refraining from discussion till that opinion was expressed".

Dr. Cooke is of the opinion that the cases are all smallpox.

Dr. Stewart has no doubt of them all being smallpox.

Dr. James views three of the cases as aggravated chicken-pox: but is of opinion that the boy has smallpox.

Dr. Thomas is doubtful regarding three of the cases whether they are chicken-pox or smallpox, but is certain that the fourth case is smallpox.

Dr. Motherwell wishes to express an opinion equally strong as that advanced by Dr. Stewart, that there is not one of them smallpox. That he is at the present time attending one of Dr. Youl's children who is as ill as the lad—the other children of the same family having had an attack of that disease.

Dr. Pugh is of opinion that all are cases of chicken-pox.

Dr. McCrae has no doubt that they are all cases of chicken-pox. Denies that any of the pustules is umbilicated or confluent.

On the following Tuesday the gentlemen forming the Commission met again. The result being, that Drs. Thomas, Barker, Motherwell, James and Pugh all gave the same opinion regarding the disease and in the same words: they also stated that the place was suitable and that the patients ought not to be removed as removal would be dangerous: Drs. Crooke and Stewart gave their opinion that the place was altogether unsuitable. The former stating that the patients decidedly ought to be removed: the latter that it might be hazardous to some of the patients to remove them. Dr. Pugh considered that the place was not suitable for an hospital.

## Correspondence.

### SCIENTIFIC WRITING.

SIR: Your very important leading article in the journal of April 14, 1956, encourages me to relate to you and your readers some observations I made a few days ago. In the morning's mail I received a reprint of an article written by two Americans and published in an American journal. The

<sup>1</sup> From the original in the Mitchell Library, Sydney.

article, which reports excellent investigational work, begins with an historical introduction, and it does not need a linguist to see that the name of the German author, who is said to have described the condition under discussion for the first time, is obviously misspelt. Thinking that this was just a printer's error, I turned to the references. However, there was not only the same mistake in the name, but the two lines that purported to give the title of the paper were actually the dedication of the paper to a learned professor of the time. This was in the morning. In the afternoon of the same day (it was Friday the thirteenth!) I received a copy of a new book written by an English author, published in London and just arrived in Melbourne. It contains a chapter on the same disease as the American article discussed, and in its historical introduction there is the same spelling mistake of the name, and in the references the same mistaken quotation of the dedication in place of the title of the paper. At first I was wondering who had copied from whom, but a consideration of the dates at which the paper and the book had been published made it unlikely that this had happened. Both authors had probably copied from a third. And so it was. In 1953 an American abstracting journal had published a very comprehensive review of the subject under discussion, and a glance through this article showed immediately that this was the common source on which both the American and English authors had relied.

It is unfortunately certain that a fair amount of this copying is going on in scientific publications. It is, however, not often so easy to detect this practice. I am not suggesting for a minute that everyone who writes a paper on some subject should read for himself every article that has been written before. But would it not be far more honest to begin an article by saying: "The literature on this subject up to 19xx has been very fully reviewed by . . . in . . .", then summarize the salient features and go on from there with the account of their own work? To create the impression that an extensive study of literature has been done when the actual work amounted to copying from the last review article is a practice that should really have no place in honest scientific writing.

Yours, etc.,

The Royal Women's Hospital,  
Melbourne,  
April 17, 1956.

H. F. BETTINGER.

## HEROIN.

SIR: Some time ago I wrote a short article under the heading "What is wrong with Heroin?". There were a few well-reasoned replies, but the general view was that there was "nothing wrong with heroin, that it was a most useful drug so long as it was controlled by the medical profession". In other words it had to be prescribed and used only in necessitous cases. Since then very few, if any, of the "big men" in the profession have bothered to take the matter up, especially in Australia, and I wonder why? Does anybody know? It was therefore with feelings of, may I say, "elation" that I read a reproduction of an article in THE MEDICAL JOURNAL OF AUSTRALIA of April 7, 1956, by D. R. W. Cowan. I perused this very carefully, and I must say I agree with every bit of it, and he could have made his arguments even more forceful.

Every practitioner must know of Sydenham's aphorism that "without the help of opium few would be sufficiently hard hearted to practise medicine". This is still true today, because no other drug can completely replace the morphine group of drugs with regard to the relief of pain, and heroin is the most effective of all and to date has no substitute. Let me reiterate and expand. The opium alkaloids have a sedative action that makes them the only drugs which will produce sleep, when sleeplessness is due to pain. These properties make morphine one of the most indispensable and important drugs used in therapeutics. Heroin is derived from morphine and in beneficial action is streets ahead of it in every way.

I think that in this matter we should consider the suffering public only. The addict is quite another problem, for if he does not suffer pain, there are many methods by which he can break himself of the habit if he be so inclined. I do not regard heroin as a substitute for morphine; it is a drug on its own, as it were, and, as I have suggested before, much superior in every way.

Taking pethidine into consideration, I pointed out some time ago that this drug would be the next to go, and some critics wondered how I knew. I did not know; it was just

a process of reasoning. You must know that when a drug becomes popular, this is regarded as a good reason for deleting it. Why? Some time ago a misguided individual wanted to have a go at "Ye Olde Cuppa Tea"; but I am sure the public would not stand for this. I hope our "guardians" and administrators will leave pethidine alone, because I have used it a couple of times on myself for renal colic with the most beneficial results. Without being vindictive, it seems almost a pity some of our critics have not had an attack of renal colic; they would then really know something.

Sir Darcy Cowan's remark that his own view is that the heroin ban is unwarranted and absurd has my full support and approbation, and I agree that the matter may have been forced upon us by political action. The fact that the ban was approved by about one hundred council members when some six thousand members of the profession were left with no voice at all on the subject is very disturbing. Sir Darcy adds that all is not yet lost. I hope he is right and wish him the best in—may I call it his crusade? I think his *questionnaire*, "1. Are you in favour of a complete ban on heroin in Australia? 2. How many cases of addiction have you seen in the last ten years?", should meet the case. Most people will be surprised.

I have before me a copy of *Hansard*, April 10, 1956. In reply to a question put to him on the banning of heroin, as part of the Minister's reply I quote: "The position at present is that the Australian Government has taken this action, that the States have either passed or indicated that they are prepared to pass the necessary legislation, and that this has been done on the advice of the medical profession of Australia." I take exception to the meaning involved in the last three lines, "and that this has been done on the advice of the medical profession of Australia". Will, therefore, the Minister for Health have the courtesy to name the members of the medical profession who supplied this statement, and will they in their turn indicate what written authority they had from the various members of the medical profession to speak on their behalf?

Yours, etc.,

229 Macquarie Street,  
Sydney,  
April 18, 1956.

W. ALEXANDER DUNN.

## REFERENCE OF PATIENTS TO PUBLIC HOSPITALS.

SIR: The April circular of the Victorian Branch of the British Medical Association contains a plea from the medical superintendent of the Royal Women's Hospital. He suggests that general practitioners requiring second opinions or investigations on their patients refer only those persons whose incomes entitle them to treatment as public outpatients.

I would imagine that very few doctors send patients of obvious affluence to public hospitals as a matter of choice. Doubtless there are patients so referred who can afford to pay private fees, but generally speaking most practitioners, having a fair approximation of the economic circumstances of their patients, seek public hospital treatment for those who apparently cannot meet the very high cost of private investigation.

Most general practitioners have neither the time nor the desire to assess their patients as required by the means test. In any case the inflationary spiral and depreciation of real wages is reaching a level where increasing numbers of people who would prefer private medical treatment can no longer afford it.

Yours, etc.,

65 Chapel Street,  
St. Kilda,  
April 23, 1956.

EGAL WHITE.

## THE ARTHUR WILSON MEMORIAL LECTURE.

SIR: I read with great enjoyment the Arthur Wilson Memorial Lecture by Professor B. T. Mayes published in THE MEDICAL JOURNAL OF AUSTRALIA of April 14. My enjoyment was not only in the excellent subject matter of the lecture, but also as one of the late Arthur Wilson's many "grateful fathers", and as a fellow member of the College of General Practitioners with Professor Mayes.

I am sure Professor Mayes will approve of my action in drawing your attention to one point which he brought out. I refer to the absence of information as to the overall incidence of eclampsia in this country.

At the time that the lecture was given, the Research Committees of the New South Wales and Queensland Faculties of the College of General Practitioners were preparing a paper, in which they had the valuable guidance of Professor Mayes, on this very subject. The paper has been accepted by your Journal for publication. Your readers might be interested to know in advance that the information covers about 10,000 general practice confinements in 1954, and shows an incidence of eclampsia of 1.04 per 1000 in New South Wales and 2.07 per 1000 in Queensland, with a combined incidence of 1.48 per 1000.

Yours, etc.,

JOHN G. RADFORD,  
Honorary Secretary, Research Committee,  
College of General Practitioners, New South  
Wales Faculty.

131 Macquarie Street,  
Sydney,  
April 18, 1956.

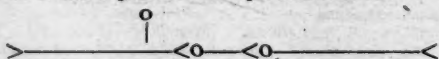
#### THE DEVELOPMENT OF MODERN PSYCHIATRY IN RELATION TO MEDICINE AND SURGERY.

SIR: It is with regret that I have received from Dr. Collin, together with a copy of his answer to my letter (M. J. AUSTRALIA, February 4, 1956), a letter stating that with the advent of term, he will be fully occupied with his students and no longer able to spare the time necessarily involved in preparing and writing letters for publication—a point that I full well appreciate. Although this may give me an unfair advantage, and henceforth makes the issue completely one-sided, it seems to me, in fairness to my subject, his letter (M. J. AUSTRALIA, April 14, 1956) should be answered.

Taking into consideration that part of the material in my Stawell Essay which Dr. Collin and I have been discussing, I think it will help to subdivide the nervous system into its peripheral portion (as represented by exteroceptive nerves), its central portion (the brain) and a special part of the brain composed of impressed neurons. This division is based on function and may be restated as follows. The prime function of exteroceptive nerves is transmission of impulses, that of impressed neurons is to record impulse characteristics and that of the brain, in this regard, to interpret the characteristics. The point I wish to make here is that impressed neurons are primarily recording agents, their purpose is neither transmission nor interpretation of impulses. I cannot let the issue be clouded by allowing complexities of transmission and interpretation to be admixed with that of recording, to the detriment of the impressed neuron theory (see paragraphs 5 and 8 of Dr. Collin's letter).

Dr. Collin, paragraph 4, appears now to have changed his main objection to my essay from the "all or none" quality of nerve impulse to, or added to it, a difference in our understanding of the reflex arc. He does not appear to state clearly wherein the difference lies unless it is he thinks that I have over-simplified my subject. He does, however, show a diagram of a simple reflex arc, which he uses for teaching students, and classes it with the equation  $2H_2 + O_2 = 2H_2O$ . Is not my contention exteroceptive impulse + specialized neuron = impressed neuron but another example of the same class? All being simple representations of complex processes.

Further, I consider his diagram of a reflex arc excellent for my point of view, and I would ask him when using it for students to add, on my behalf, that the internuncial neuron shown in it can represent an impressed neuron.



I would point out that Dr. Collin's paragraph 5 does not concern the function of recording, but seems to refer mainly to transmission of impulses; so long as this is clear, I have no quarrel with it. One point in this paragraph is of special importance to me: "The nerve impulses occur in a time sequence such that if recording electrodes are placed on the auditory nerve and the amplified electrical currents activate a loud speaker, the original sound can be recognized." With suitable apparatus the electrical currents can be recorded on a wire or tape recorder and the original sound be reproduced at will. The changes that occur in

the tape or wire (I believe they are largely a matter of molecular orientation) are those with which I am concerned. My contention is that similar changes, analogous, if not the same, to those which take place in electrical recording on wire or tape, occur in impressed neurons.

Further support to the impressed neuron theory seems to be given by a report, published about three years ago, in which it was shown that electrical stimuli, applied to certain areas of the brain exposed at operation under local anesthetic, induced memory of past incidents to enter the subject's mind. I regret that I overlooked this reference when writing the essay.

Paragraph 6 fails to allow for the evidence obtained from patients under hypnosis, in whom the present stimulus arouses memories of long past incidents and provokes the same motor response. This is dealt with in my essay, for it was one of the main reasons suggesting neuron theory. The impressed neuron theory explains in a quite specific manner how conditioned reflexes could be formed.

Paragraph 7: I am afraid I am not quite certain what Dr. Collin means here. If he means that animals have no conscious mind or intellect, I cannot agree with him, and would refer him to the "Minds of Animals" by Professor J. Arthur Thompson (1927) or advise him to study comparative psychology under natural as well as experimental conditions. The most important feature of Pavlov's theories of conditioned reflexes, based on animal experimental studies, is that they are applicable to human behaviour. If his meaning is that the conscious mind is a thing apart, in no way connected with the rest of the nervous system, then again I cannot agree, for this runs contrary to the principles of evolution and the facts disclosed by the study of comparative neurology. Professor R. J. A. Berry's "Brain and Mind" (1928) devotes a chapter to the "Evolution of the Cerebral Hemisphere" (in man) and deals with this matter. I would say that a person recognized only by virtue of his brain neither is operative without the other.

Paragraph 8: In my opinion this paragraph deals mainly with the interpretation of stimuli by the brain and is not relevant to impressed neurons or their function. I do not disagree with any of it; I have no idea how the brain interprets impulses; consequently my essay makes no attempt to show how it is done.

Paragraph 9: I am very doubtful if the "all or none" quality of a nerve impulse, except in its relation with transmission, is a vital factor in the recording of nerve impulse characteristics. Although Dr. Collin made this point the basis of his main objection to the impressed neuron theory, he has dismissed my questions in this matter, apparently as not worthy of consideration because the "all or none" quality has been accepted since 1912 and details about it are now common knowledge. For this same reason I feel that my queries were deserving of more specific answers; because he has not supplied this information, I will give further consideration to the subject now.

Dr. Collin in his previous letter implied that the quality of an impulse is not changed whilst passing through a neuron, but I would remind him that the impulse rate or time taken in transmission can be altered; thus if the nerve is cooled, the rate is slowed. Other factors showing that the impulse rate is alterable are that its velocity varies in relation to the diameter of the nerve fibre through which it is passing, and that non-medullated fibres conduct an impulse more slowly than do medullated ones. In paragraph 5, Dr. Collin makes the point that the time sequence of impulses is important; therefore a change in the transmission rate may be of significance. Conduction of an impulse depends on the state of the fibre at the successive points reached by it, and the "all or none" quality pertains only for the condition of the nerve at the point where and the time when the impulse arises. Because of this, variation of the condition of the nerve may alter the degree of the response to a standard stimulus.

The "all or none" quality of nerve impulse is based on experimental work using a nerve-muscle preparation. The nerve in it consists of axons only (the rest of the neuron being omitted) which, under natural conditions, have no other function than to provoke a response in the muscle to which they are connected. The stimulus is relatively crude—electrical, chemical or mechanical. The response is measured by muscle reaction or instruments. I do not claim that the "all or none" quality does not apply to brain tissue, but these experimental conditions are very different from those encountered by an impulse passing over a complete neuron in the brain under natural conditions. There may be other qualities, dependent, for example, on molecular arrangement, not demonstrable with the nerve muscle preparation, but which, like timing, can be made to alter.

Both Sherrington and Eccles, before using the behaviour of nerve cells in the spinal cord as a guide to those of the cerebral cortex (and this relationship seems much closer than cerebral neurons to peripheral axons), acknowledged that there could be a difference even though they thought it most unlikely.

In a matter that is involved and difficult to understand, where we are not absolutely sure, it is hardly wise to be dogmatic.

At the present state of our knowledge of the nervous system no one is likely to dispute the statement made in paragraph 10 by Dr. Collin, that it is extremely complex. But it is just this type of statement, stressed so often and for so long by teachers in this subject, that has formed an association linking the nervous system with insuperable complexity. Because of this, students, who otherwise would help to advance our knowledge of an important subject, have their thoughts turned from contemplation of it.

The greater the complexity of a problem, the more likelihood of it consisting of a wide variety of components and/or of their repetition. Both these two factors, variety and repetition, aid in the disclosure of some at least of the constituent parts, and having gained a foothold in this manner, eventually the whole may be unravelled.

I am confident that the nervous system is no exception to this generalization, but for those who hold the contrary view, I am adding hereafter a number of reasons, grouped accordingly to the subjects from which they are drawn, on which my belief is founded. All of these reasons, but a small portion of our precise knowledge of the nervous system, I consider to be equally precise and more important than the statement made by Dr. Collin in this matter.

1. Anatomy. The histology of the nervous system shows it to be composed entirely of nerve cells and their supporting tissue.

2. Physiology. Biophysics has accepted the nerve impulse as the motive power of the nervous system. One can therefore claim that the structural unit of the nervous system is the neuron, its functional unit the nerve impulse. On these two simple units the whole of the complicated nervous system is based and operates.

3. Evolution. The principles of evolution give the key to how these two simple units are combined to produce the most complex forms. The mammalian nervous system, in common with all other body structures, has developed through a series of innumerable changes, each barely perceptible, and therefore correspondingly simple.

4. Comparative neurology. Biological studies of the nervous system of various forms of life show all gradation from the simplest up to the complex form of man and the higher animals. Sufficient specimens of the various types of life developed in the process of evolution remain in existence at present to allow the course of evolution of the nervous system to be observed in all its main stages from simple to complex. From this study it is apparent that even the most advanced forms have origin from the simplest.

We have therefore not only evidence of simple components of the most complex nervous systems, but also how these have been used in its formation. As if these were not sufficient, samples of the main individual stages are available to show the path that has been followed.

Of particular reference to the human brain are two important characteristics: (a) Its versatility. The number of separate and distinct acts performed by the brain is quite astounding; if each were extremely complicated, but one or two should exhaust its capabilities. (b) Its speed of action. The rapidity with which the brain performs its functions is such that results are almost instantaneous; this does not seem a likely possibility if complicated processes are performed. In suggesting that the mode of operation of the brain is much simpler than our present knowledge indicates, each of these characteristics reinforce the other.

All of these facts have long been common knowledge, and must be known by Dr. Collin. That he has made no reference to these points, but stresses the complexity of the nervous system, is an excellent example of how the association of the nervous system with complexity conditions the mind, or should I say person, debarring those thoughts that might lead to the resolution of the complexity. I would therefore ask Dr. Collin and others who give instruction about the nervous system not to refrain from teaching that it is most complex, for this is true, but always to qualify this statement in such a manner that it will make the probability of its ultimate understanding the dominant thought associated with it.

Dr. Collin has helped me considerably by the information he has given in his letters. Although he claims that our views differ considerably, I do not think that they are irreconcilable, nor that the material he has brought forward disproves the impressed neuron theory. I thank him again for his letters and interest, and am very sorry he will no longer be taking part in the discussion.

Yours, etc.,

H. B. RUDDUCK.

940 Nepean Highway,  
Moorabbin,  
Victoria.  
April 17, 1956.

[This correspondence is now closed.—EDITOR.]

## Obituary.

THOMAS FRANCIS RYAN.

Dr. F. F. D'Arcy writes: Though I used to meet Dr. Ryan from time to time in recent years when he came to Melbourne, and though in appearance he never seemed to change, I best remember him as he was in 1924 when I was privileged to be his assistant at Nhill. He was then sixty years of age, but seemed older, more staid and more careful of expenditure of energy than one would expect, except in one whose aim was longevity. He had a reputation of being difficult to live with, but I did not find him so, and I have always looked back on 1924 as a happy, interesting and mentally profitable time. Of course, with his wide and long experience, his constant reading and holiday travels, he was entitled to have firm opinions, and he was a difficult man to outwit in argument or discussion. His trump card when cornered was the retort: "My dear fellow, I was doing this before you were born." There was no answer to that, for he began practice in Kaniva near Nhill in 1886. He must have been one of the last of the horse and buggy doctors, for in 1924 we still travelled in a fine hooded buggy drawn by a pair of dappled greys driven and cared for by Lawrence Farrelly, who after eight years of service left to visit his relatives in the old country in 1924 and did not return. A period of hire car transport followed before T.F. finally cast old custom aside and purchased a car.

Dr. Ryan had a very extensive practice, extensive both in area and scope of work. Frequently patients travelled a hundred miles and more across country to seek his aid, and he had much to offer them—the latest in X-ray apparatus and a small laboratory, where bacteriology and the simpler biochemistry were done; ionization was extensively used (and some diathermy) for most fibrositic and rheumatic conditions. There was generally someone on hand receiving surgical ophthalmological treatment, for which he had a flair, and refractions were frequently an everyday task. General medical and surgical patients received a thorough investigation, and my nights were occasionally disturbed with midwifery at the local private hospital. Until his retirement Dr. Ryan continued his long years of service to the Nhill Public Hospital, where there were some thirty beds and an isolation block, where typhoid provided its quota of patients. Looking through a skimpy diary of work done in 1924, I am surprised today at the variety of patients seeking his aid. He was very conservative, and except in acute cases there was a good deal of masterly inactivity before he would accept the responsibility and anxiety of major deliberate surgery. These were pre-antibiotic days, and there was little defence against established sepsis. Having begun surgery before Lister, he then went through the carbolic days, and in 1924 still followed an elaborate pre-operative scrub-up technique, which included soaking the hands and forearms in a warm solution of permanganate of potash, followed by a soak in hyposulphite of soda solution—rather hard on the skin and nails. When fully gowned for operation he wore an elaborate head dress, the only opening being a narrow window for vision, so that he looked like Ned Kelly in white starched armour or a member of the Ku-Klux-Klan—rather an uncomfortable attire in a hot climate, but an expression of his quest for perfection. Armed with modern antibiotics he would have been more adventurous, his technique was good, and he had in abundance the greatest treasure of all—wide experience.

In his time T.F. had dealt with the medical disabilities of at least four generations. An adult patient would often remark: "I think you treated my father, doctor." T.F., with his gold pince-nez a little askew, a smile and a nod would reply: "Yes! and your grandfather, too." He was fre-

quently distressed to see some of the old pioneers, who had cleared, fenced and first cultivated the land, brought by motor truck to the public hospital and dumped like a bag of potatoes, and the only anxiety the relatives seemed to have was whether father could still get the pension while he was in the public hospital. His fellow practitioner at Nhill was Dr. G. Middleton, who occasionally sought his aid in consultation. Following the old traditions and compelled by the spirit of *noblesse oblige* T.F. dressed for the occasion, with spats, soft gloves, hard hat, sometimes his cane and always an air of mystery and profound wisdom.

As I knew him in 1924 his life was happy and full of interest. His knowledge of the local flora and fauna was complete. He still kept a collection of birds and their eggs, mounted in earlier years, and he had a collection of Mallee wood carvings of which he was very proud. A pair of English setters were kept very busy during the quail season, and quail on toast was a frequent dish on his generous table. His brother, the late Dr. Edward Ryan, used to make a few visits during the season, and my notes record their returning at dusk with as many as 48 quail. He knew from long personal experience the early history of his district and planned to write a medical history of the Wimmera; but I think the canvas grew too wide, the ideals too high, and the span of each day's energy too narrow for its completion.

One had only to see T.F. to know that he was in every sense a gentleman—his upright bearing, his grand manner and speech and his concern for the welfare of others, his gentle sense of humour and his high ideals. He used to say that merit was the one sure factor that made for success, and it would seem that he followed this principle. Apparently he had no vices, he had little use for alcohol, and when he smoked it was ivory-tipped "Vice Regal" cigarettes, which seemed in keeping with his general bearing and the black coat and striped trousers he always favoured.

Few of his patients will be left to mourn him, since he retired from practice some twenty-five years ago; and, having made his final retirement at over ninety-one years of age, he has probably outlived them all. There is no evil to live after him; but a great wealth of good deeds, long years of generosity and the establishment of prizes for nurses and final year medical students will, in the immortal words of Horace, defy the elements and time, be more lasting than a monument on bronze and perpetuate his memory. "*Non omnis moriar.*"

#### HUGH MORRIS TAYLOR.

A COLLEAGUE sends the following appreciation of the late Dr. Hugh Morris Taylor.

Hugh Morris Taylor, lately Assistant Director of Medical Services, Department of Railways, New South Wales, was the son of a much respected minister of the Methodist Church, and was brother of the popular and very likeable personality, Johnny Taylor, the cricketer. The brothers were almost twin-like in their appearance, in their success in sport at school and university, and in their modest and unassuming manner. Hugh always regretted that, having progressed into his medical course, he had to remain at home when Johnny joined the first Australian Imperial Force. He was an honoured "Old Eoy" of Newington College, where he achieved almost the same number of sporting badges on his blazer as his brother, who probably holds the record for that school.

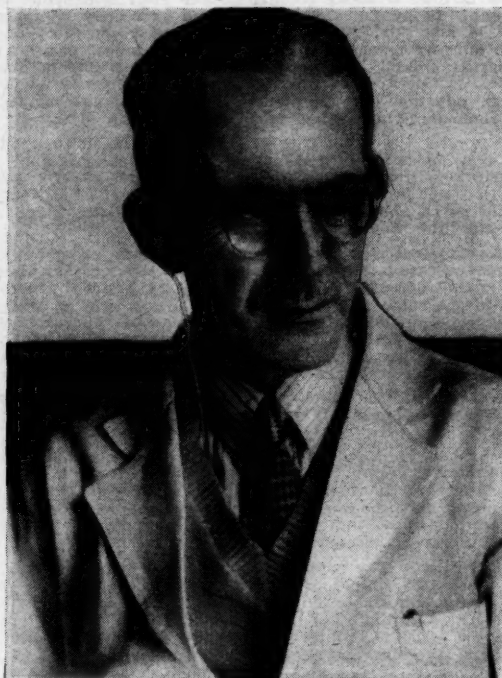
He came down from the University of Sydney with his M.B., Ch.M., and an enviable sporting record including "blues" in football and cricket. After resident experience at Newcastle Hospital and at the Coast Hospital, he took up practice at Dora Creek and married. However, in 1926, owing to the severe and disabling illness of his wife, he returned to Sydney, where he accepted a position of assistant medical officer in the Department of Railways.

It was about this time that his hearing deteriorated, and this fact, added to the illness which made his wife almost confined to the house, induced Hugh to withdraw a great deal from life outside his home and his office. A keen interest in building and running an electrically controlled model railway of considerable size was really one of the effects of his defective hearing.

The birth of a son in 1928 became a focus of Hugh's joys and aspirations, sharpened by the death of his wife in 1942. The son, John Morris Taylor, graduated in medicine and is in practice in Taree. Later Hugh married Jean Edwards,

widow of Dr. Alan Edwards, and with her enjoyed the bringing up of her two sons and his own son John in a cheerful and friendly home.

In the Department of Railways his work was largely concentrated on eye work—the examination of eye injuries, eye diseases and vision defects. He was responsible for the maintenance of safe standards of vision and colour vision, and his long experience and interest, particularly in colour vision problems, enabled him to speak with authority on



these matters. He was a member of the Committee of the Standards Association of Australia for Investigation of Eye Hazards in Industry.

No one could ask for a more gentle, reliable and considerate person as a colleague. Hugh probably never made an enemy at any time in his life; his like is not often met. Not even the sorrows of his earlier life, the occurrence of two previous cardiac episodes and other ills, or the frustrations and discouragements of this current age had embittered him or disturbed his placid outlook on life. His fellow officers, the office staffs and all those who knew him will regret that no more will they have his cheerful and comforting friendship. We all deeply sympathize with his widow, his son John, his stepsons, and all his relatives.

#### OSWALD BARTON.

DR. OSWALD BARTON died on February 6, 1956, at Scone, New South Wales, where he had been in general practice for many years. He was born on January 8, 1888, being the son of Sir Edmund Barton, later to become the first Prime Minister of Australia. He was educated at the Sydney Grammar School and at the University of Sydney, where he graduated in medicine in 1914. In the following year he joined the Royal Army Medical Corps and went to England, only to be returned to Australia, after having been invalided out of the Royal Army Medical Corps. Later he joined the Australian Army Medical Corps and served overseas. Subsequently he went into general practice at Scone, New South Wales, where he was known as a very kindly person with a great sense of humour. Ill health prevented him from practising for some years before his death, but his great popularity was evident from the large attendance at the funeral service. His wife predeceased him by three

years, but he is survived by three children, a daughter and two sons, one of whom is in medical practice at Scone.

DR. R. J. JACKSON writes: Oswald Barton was a member of the Northern District Medical Association of New South Wales from 1921 to 1956. He was President in 1948, when the area of this Association extended from Muswellbrook in the south to Tenterfield in the north and included many north-western towns.

Practising in Scone, Barton was not able to attend very many of the whole-day business and clinical regular meetings of the Association, which, to suit the convenience of as many members as possible, were held usually in the more centrally situated towns of Tamworth and Armidale. During his year of office as President he carried out his important duties with genial efficiency. His chairmanship of meetings was marked by smooth conduct of the business before members, however controversial it might be, and a tolerant consideration of all shades of opinion expressed. Barton's after-dinner speeches were invariably refreshing, and notable for crisp humour and amusing anecdotes, which created an atmosphere of goodwill and enjoyment. It was a very real pleasure for me as the then Honorary Secretary to be associated with Barton in the conduct of the Association's affairs.

Visiting Barton in his home at Scone was a similar delight. A man possessing a happy nature, a generous outlook and a real interest in his fellows, he always made one feel very welcome. He had a fund of stories, medical, political and legal, which, when told by him, splendid raconteur as he was, made the hours slip by unnoticed. He bore ill-will to no man, least of all to his colleagues. He had a friendly personality, so that meeting him once you were always pleased to meet him again. What has been written of his famous father, Sir Edmund Barton, can be stated for Oswald: "The history of his later years, except where it was interrupted by severe illness, is a record of honoured but on the whole inactive serenity."

Vale, Barton, you have left with us all an honoured and affectionate memory!

#### JOHN BERCHMANS DEVINE.

DR. BARRY MULVANY writes: Today's journal brought tributes to the late John Devine (M. J. AUSTRALIA, February 25, 1956). Of his technical achievements I knew a little; of his personality a great deal. Our first clash was in a debate at Xavier College, the second in a House mile race. He slew me in both. I might have expected the first victory, as he had just returned from Beaumont, where he had taken a prize in English. In the years between I benefited from his kindly interest in a lesser mortal on the fringe of his spheres. In an age in which character assassination has replaced manlier forms of aggression, John Devine was open, fearless, downright. I enjoyed his ripostes when I made the jocular taunts of the psychiatrist about surgery's contribution to the volume of psychiatric cases. He pursued his life aims and lived out his personality with honesty and vigour. He had a thorough disregard for slanderous suburbia. Not the least of his qualities was a universality of outlook, above the sectional differences which mark Australian life. His energy was astonishing. One memory, which I share no doubt with many other contemporaries of his, was his versatility at Somers Camp.

#### JOHN WALWYN SHEPHEARD LAIDLAY.

DR. MALCOLM EARLAM has supplied the following appreciation of the late Dr. John Walwyn Shephard Laidley.

John Walwyn Shephard Laidley was born in Sydney in 1900. His father, Shephard Edgecliff Laidley, merchant, was also born in Sydney, in 1861, and was vice-president of the Union Club for many years. His grandfather, William George Laidley, M.L.C., was born in Sydney in 1828, and his great-grandfather, James Laidley, landed in Sydney on May 12, 1827, as Deputy Commissary-General of the Colony, then thirty-nine years old. He had previously served in Canada and the West Indies and commenced his career in the Commissary Department in 1806 in the army on the Peninsula, under the Duke of Wellington.

John Laidley, after a career associated with consistent high performance, left the Sydney Grammar School in 1918 and commenced his medical course early the following year,

graduating in 1924 with first class honours. He was then appointed as resident medical officer to the Royal Prince Alfred Hospital. In his first year he had six months each with Gordon Craig and A. E. Mills and naturally and normally obtained a senior appointment the following year. At this time none of the teaching hospitals offered third year residencies such as are now open to suitable men, but in 1926 Gordon Craig had succeeded in having a department of urology established at Royal Prince Alfred Hospital. After this he endowed a Fellowship in Urology at the University of Sydney, a three-year appointment in the course of which for the first time in Australia the way would be made clear for a suitable man to receive a complete urological training, including research work at a urological research laboratory. Impressed with Laidley's qualifications in every way, Gordon Craig invited him to apply for the first Fellowship. The letter he wrote is still extant, and portion of it reads as



follows: "If I give a Fellowship in Urology to the Sydney University it will have to be advertised. . . . My talk to you can only go as far as to say that you, in my opinion, are the most fitted intellectually, physically and morally to fulfil all the requirements necessary."

Laidley in due course commenced his three-year tenure of the Gordon Craig Fellowship in Urology on May 1, 1926, and apart from the routine clinical training he received carried out valuable research work on renal anatomy, urinary tract infections and phosphaturia. At the end of his Fellowship he went for a trip overseas, visiting urological clinics in England and the United States of America, commencing consultant practice on his return and, on the retirement of Gordon Craig from the staff of the Royal Prince Alfred Hospital and the Royal Alexandra Hospital for Children in 1930, being appointed honorary assistant urological surgeon to both hospitals. On the death of R. K. Lee-Brown in an aeroplane accident in 1934, John Laidley found himself at the age of thirty-four years in charge of the department of urology at each.

As all who were associated with him know, he proved more than equal to the heavy responsibilities that these appointments entailed. Naturally at the outset he was more than a little apprehensive of his ability to hold them down and stated that for some little time he would of necessity "bat for his average". It is probably not generally realized how small by present-day standards the urological turnover was at this stage. No major surgery was done by the Urological Fellow till his third year, during which he might average

perhaps an operation a fortnight, while the next few years were lean in the extreme; so that when he inherited these senior appointments he probably had behind him only some fifty or sixty major operations. His feelings of apprehension therefore were as normal as they proved to be unjustified. It is safe to say that at the time of his death, and for a very considerable time beforehand, there was no urologist in Australasia—or possibly anywhere else—to whom a patient could commend himself with greater confidence.

Apart from the practice of his specialty, Laidley devoted his time and energy freely in any direction in which they were requested. He was a Foundation Member of the Urological Society of Australasia, served on the executive of this body for several years and would have been President this year had he survived. He was for many years the Honorary Secretary of the New South Wales State Committee of the Royal Australasian College of Surgeons, and finally became its President some years ago. When the College instituted Fellowship examinations in the various surgical specialties, he and Henry Mortensen were the first two urological representatives on the Court of Examiners. He was Vice-President of the Royal Prince Alfred Hospital Medical Board and would have been President but for the fact that he did not feel that his health would permit him to do the appointment justice. Throughout the war he was also a member of the New South Wales Medical Coordination Committee. He did not relish the fact that his civil responsibilities were incompatible with service in the armed forces, and it was quite typical of him that, despite the activities mentioned above, plus the fact that he was also called on to act as relieving consultant urologist at hospitals where he did not normally attend and where the work was not inconsiderable, he still felt he must do something further, so managed somehow to fit in also a routine session examining army recruits.

In October, 1954, he suffered a coronary occlusion, from which he made a reasonable recovery, but not so complete as he would have had his colleagues believe. Twelve months later he had a brief attack of aphasia, then a more prolonged one which he could not conceal. He entered hospital and made an apparently complete recovery, leaving in excellent spirits but with a future of necessity totally unpredictable. The following night he complained of a severe headache, and went rapidly into a coma from which he did not emerge. The end came the next day, November 7, 1955.

John Laidley was essentially a person who did all things that lay within his power to do to the best of his ability—in other words, a perfectionist—and considered it his duty to make use of any talent of which he felt himself to be in possession. In school days he coxed the school eight and shot with the rifle team; after this, during his medical course he was a rowing "Blue" and represented Saint Paul's College in rowing, shooting and tennis, and was also secretary of the Tennis Committee and a member of the Sports Union Committee in 1923. His greatest affection, however, was for the snow—an annual visit to the snowfields became routine, and he was a member of the party of five, led by Sir Herbert (then Dr.) Schlunk, which made the first winter cross-country traverse from Kiandra to Kosciusko. He was also a capable ski-jumper, an activity which requires considerable nerve and judgement. He did not resume his ski-ing after the war, but concentrated on golf, which he played with more than average merit.

He had an intellectual capacity far above the average. Very few people know that when *The Sydney Morning Herald* commenced publishing cross-word puzzles these were the products of John Laidley's fertile brain. He supplied them regularly for some years, but had to desist when his practice began to approach sizeable proportions, and to decline the offers of substantially increased remunerations that were conveyed to him. He was a most valuable man in committee, with an exceptional faculty of mentally collating all the available facts bearing on any problem and rapidly and unerringly, and it seemed instinctively, finding the correct answer. He could stand up and speak his thoughts with clarity and brevity. He was widely read, and retentive of his reading, and during his last illness it was difficult to lend him a book of any quality with which he was not already familiar. His knowledge of and appreciation of music were also on a high plane.

He was by nature reserved and for this reason was by some considered a little difficult, but to those who knew him he was, while he did have his rather silent phases, the easiest of people to get along with.

He was also regarded as considerably calm, imperturbable and unworried, which was not the case. Student lectures were always a strain—he was worried lest they should be found dull or uninspiring, and relieved and delighted when,

as happened more than once, the termination of his final lecture to fourth year was marked by applause. He consistently concealed any major or minor mental turmoil, which may or may not have been a good thing. With colleagues or subordinates who were doing the best they could, he was patience personified. With such as did not, he was superficially much the same but far different emotionally.

No surgeon ever deported himself better, or inspired greater efforts on the part of others, in the operating theatre. His punctuality was, as near as humanly possible, absolute; and if he was five minutes late for an operation, the staff would start to get a little worried. His public hospital work consistently received absolute priority. One doubts whether he ever deferred or delegated a public hospital obligation for any reason other than sickness or normal leave.

As a third-generation Australian he was intensely loyal to his country and jealous of her welfare, and equally loyal to his chosen profession, jealous of its reputation and proud of its achievements. Although he derived the normal degree of satisfaction from his own work, his keenest satisfaction and at times delight was from good work done by others. Years ago a patient was referred to him by a country practitioner, who had dealt with the emergency occasioned by a gunshot wound of the abdomen perforating bladder and rectum. By the time he reached Sydney all there was left to do was close the cystostomy and colostomy, and John Laidley more than once recounted the case-history to an overseas visitor with infinitely more pride than he ever evinced in respect of any of his own achievements.

To John Laidley the only way of doing things was on the best possible basis. Some months before his death he told with some amusement a story of his childhood days, not thinking that it was a perfect illustration of his whole approach to life. His elder brother one day said to him: "Come on, John, you and I have challenged the two girls next door to a tennis match." John, who had never played tennis, picked up a racket a little uncertainly (he had a tendency to ambidexterity), and his brother said: "Which hand do you play with?" Young John replied: "I don't know. Which hand does Norman Brookes play with?"

## Post-Graduate Work.

### THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

#### Examination Results.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that the undermentioned candidates satisfied the examiners at the recent examinations for Part I of the various medical diplomas of the University of Sydney as shown:

Anæsthesia: B. K. Crawshaw, W. S. Gegg, R. J. Killalea.

Dermatological medicine: J. R. F. England, B. R. Entwisle, A. C. Green, M. O'Loughlin, K. G. Poyzer, E. H. Taft.

Laryngology and oto-rhinology: O. J. Davies.

Ophthalmology: J. S. Rogers, Phyllis M. Waddy.

Psychological medicine: Lesley H. Barnes, J. H. T. Ellard, J. Grady, Patricia Kirtle.

Diagnostic radiology: J. D. Cashman, P. Grattan-Smith, B. L. Greer, F. M. Stackpool, F. Wishaw.

The following candidates were successful in passing the recent examinations for the diploma in clinical pathology: Group I: Tatiana Jelihovsky, C. W. Kingston. Group II: G. T. Archer, J. B. Blackwell, Monica M. Bullen, F. Jennis, C. J. McDonald, K. M. Mattocks. Group III: F. Jennis, C. W. Kingston, H. Kronenberg.

#### Revision Course at Rachel Forster Hospital for Women and Children.

The Post-Graduate Committee in Medicine in the University of Sydney announces that a full-time revision course will be held from Monday to Friday, July 23 to 27, 1956, at the Rachel Forster Hospital for Women and Children, Redfern. The course is open to all members of the medical profession, and limited accommodation is available for women graduates at £4 4s. A detailed programme will be available shortly. Fee for attendance is £3 3s., and written application, enclosing remittance and indicating

whether accommodation is required, should be made to the Course Secretary, Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney, not later than June 29, 1956. Telephones: BU 4497-8. Telegraphic address: "Postgrad Sydney."

## The Royal Australasian College of Physicians.

### VICTORIAN MEETINGS.

#### Scientific Meeting.

THE Victorian Fellows and Members of The Royal Australasian College of Physicians will hold a scientific meeting at the Footscray and District Hospital on Saturday, June 2, and Sunday, June 3, 1956. All members of the British Medical Association are invited. The programme is as follows:

Saturday, June 2: 11.30 a.m., "The New Insulins", Dr. W. Hamilton Smith; 12.5 p.m., "Broad Spectrum Antibiotics", Dr. S. Williams; 1.45 p.m., "Drug Treatment of Epilepsy", Dr. J. J. Billings; 2.20 p.m., "The Place of Drugs in the Treatment of Parkinsonism and Spastic State", Dr. J. Game; 2.55 p.m., "The Use of 'Largactil'", Dr. A. Sinclair; 4 p.m., "Salk Vaccine", Dr. P. L. Bazeley.

Sunday, June 3: 10.30 a.m., "Dietary Management of Malnutrition", Dr. John Bolton; 11.5 a.m., "Digitalis Therapy", Dr. C. J. McRae; 11.40 a.m., "Chemotherapy of Malignant Disease", Dr. Basil Stoll.

#### Lectures by Sir Lionel Whitby.

Sir Lionel Whitby, Sims Commonwealth Travelling Professor, will deliver the following lectures in Melbourne:

Tuesday, May 29, at 4.45 p.m., at the Royal Australasian College of Surgeons, Spring Street, Melbourne: "Splenic Function."

Friday, June 1, at 4.45 p.m., at the Medical Society Hall, 426 Albert Street, East Melbourne: "Anaemia in General Practice."

All members of the British Medical Association are invited to attend these lectures.

### SIMS COMMONWEALTH TRAVELLING PROFESSOR, 1956.

SIR LIONEL WHITBY, C.V.O., M.C., M.D., F.R.C.P., Regius Professor in Physic and Master of Downing College in the University of Cambridge, is visiting Australia and New Zealand as Sims Commonwealth Travelling Professor for 1956. He is accompanied by Lady Whitby. His itinerary is as follows: Perth, Wednesday, May 9, to Tuesday, May 15; Adelaide, Wednesday, May 16, to Thursday, May 24; Melbourne, Thursday, May 24, to Friday, June 8; Hobart, Friday, June 8, to Thursday, June 14; Sydney, Thursday, June 14, to Saturday, June 30; Brisbane, Saturday, June 30, to Friday, July 6; New Zealand, Tuesday, July 17, to Saturday, August 18.

## Royal Australasian College of Surgeons.

### OPEN CLINICAL MEETING.

A CLINICAL MEETING arranged by the New South Wales State Committee of the Royal Australasian College of Surgeons will be held at St. George Hospital, Kogarah, on Wednesday, May 23, 1956, at 8 p.m. The programme is as follows: Dr. A. C. Thomas, "Oesophago-Gastrectomy for Bleeding Oesophageal Varices"; Dr. C. R. Lavery, "Congenital Atresia of the Duodenum"; Dr. G. Elliott, "Secondary Carcinoma of the Ovary, Presenting as Carcinoma of the Sigmoid"; Dr. T. E. Wilson, "Traumatic Recto-Urethral Fistula"; Dr. W. J. Pullen, "Carcinoma of the Ampulla of Vater"; Dr. R. P. Melville, "Congenital Atresia of the Colon";

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED APRIL 21, 1956.<sup>1</sup>

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism .. ..	..	3(1)	3(3)	..	1	..	1	..	8
Amoebiasis .. ..	..	..	..	..	..	..	..	..	..
Ancylostomiasis .. ..	1	..	..	..	..	..	..	..	1
Anthrax .. ..	..	..	..	..	..	..	..	..	..
Bilharziasis .. ..	..	..	..	..	..	..	..	..	..
Brucellosis .. ..	..	..	..	..	..	..	..	..	..
Cholera .. ..	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus) .. ..	..	1(1)	..	..	..	..	..	..	1
Dengue .. ..	..	..	..	..	..	..	..	..	..
Diarrhoea (Infantile) .. ..	10(7)	21(10)	5(4)	..	..	..	1	..	37
Diphtheria .. ..	..	1(1)	2(2)	..	2(1)	..	..	..	5
Dysentery (Bacillary) .. ..	..	2(2)	0(0)	..	3(2)	..	..	..	11
Encephalitis .. ..	..	..	..	..	..	..	..	..	..
Filariasis .. ..	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice .. ..	..	..	..	..	..	..	..	..	..
Hydatid .. ..	..	..	..	..	..	..	..	..	..
Infective Hepatitis .. ..	97(52)	65(48)	..	19(8)	4(1)	1	2	..	188
Lead Poisoning .. ..	..	..	..	..	..	..	..	..	..
Leprosy .. ..	..	..	3	..	..	..	..	..	3
Leptospirosis .. ..	..	..	..	..	..	..	..	..	..
Malaria .. ..	..	..	..	..	..	..	1	..	1
Meningococcal Infection .. ..	2(1)	1	..	..	..	..	..	..	3
Ophthalmia .. ..	..	..	..	..	..	..	..	..	..
Ornithosis .. ..	..	..	..	..	..	..	..	..	..
Paratyphoid .. ..	..	1	..	..	..	..	..	..	1
Plague .. ..	..	..	..	..	..	..	..	..	..
Pollomyelitis .. ..	13(4)	17(13)	15(5)	6(2)	4(1)	..	..	1	56
Puerperal Fever .. ..	4(3)	33(3)	1	..	1(1)	1	..	..	5
Rubella .. ..	..	..	..	1(1)	..	..	..	..	35
Salmonella Infection .. ..	..	..	..	..	..	1	..	..	56
Scarlet Fever .. ..	15(9)	20(11)	4	10(8)	..	..	..	..	..
Smallpox .. ..	..	..	..	..	..	..	..	..	..
Tetanus .. ..	..	..	..	..	..	..	..	..	..
Trachoma .. ..	..	..	..	..	50	..	..	..	50
Trichinosis .. ..	..	..	..	..	..	..	..	..	..
Tuberculosis .. ..	31(23)	19(11)	9(5)	3(3)	3(3)	1	..	1	67
Typhoid Fever .. ..	..	..	..	..	1(1)	..	..	..	1
Typhus (Flea-, Mite- and Tick-borne) .. ..	..	..	1(1)	..	..	1	..	..	2
Typhus (Louse-borne) .. ..	..	..	..	..	..	..	..	..	..
Yellow Fever .. ..	..	..	..	..	..	..	..	..	..

<sup>1</sup> Figures in parentheses are those for the metropolitan area.

Dr. D. J. Wurth, "Perforated Gastric Ulcer, Presenting as Epigastric Abscess"; Dr. C. Hudson, "Fatigue Fracture of the Tibia". All medical practitioners are invited to attend.

## Medical Practice.

### NATIONAL HEALTH ACT.

THE following notices appeared in the *Commonwealth of Australia Gazette*, Number 19, of April 26, 1956.

#### NATIONAL HEALTH ACT, 1953-1955.

##### Part VII: Pharmaceutical Benefits.

##### Reprimand of Medical Practitioner.

I, Donald Alastair Cameron, the Minister of State for Health, in pursuance of the powers conferred on me by sub-section (1) of section 134A of the *National Health Act*, 1953-1955, hereby give notice that I have this day reprimanded David Melbourne Eldridge of 231B Esplanade, Largs Bay, medical practitioner, following investigation and report by the Medical Services Committee of Inquiry for the State of South Australia.

Dated this 26th day of March, 1956.

DONALD A. CAMERON,  
Minister of State for Health.

I, Donald Alastair Cameron, the Minister of State for Health, in pursuance of the powers conferred on me by sub-section (1) of section 134A of the *National Health Act*, 1953-1955, hereby give notice that I have this day reprimanded William Callil Hamden of Fleet-street, Salisbury, medical practitioner, following investigation and report by the Medical Services Committee of Inquiry for the State of South Australia.

Dated this 26th day of March, 1956.

DONALD A. CAMERON,  
Minister of State for Health.

## Congresses.

### ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES.

THE Association of Military Surgeons of the United States will hold its sixty-third annual convention at the Hotel Statler, Washington, D.C., on November 12, 13 and 14, 1956. The offices of the Association are at Suite 718, 1726 Eye Street, N.W., Washington 6, D.C., United States of America.

## Australian Medical Board Proceedings.

### QUEENSLAND.

THE following have been granted limited registration as medical practitioners, pursuant to Section 20 (3) of *The Medical Acts*, 1939 to 1955, of Queensland: Ko, Florence Hui Lian, M.B., B.S., 1956 (Univ. Sydney); Booth, John David, M.B., B.S., 1956 (Univ. Melbourne); Kernot, Laurence William, M.B., B.S., 1956 (Univ. Sydney).

The following has been registered, pursuant to the provisions of Section 19 (a) and (d) of *The Medical Acts*, 1939 to 1955, of Queensland, as a duly qualified medical practitioner: Kilvert, Eric Edwin Kingsley, M.B., Ch.B., 1935 (Univ. Birmingham).

The following additional qualifications have been registered: Brett, Peter Ronald, D.O. (Univ. Melbourne), 1955; Ferrier, Thomas Mayne, M.R.A.C.P., 1955; Burton-Bradley, Burton Gyrth, D.P.M. (Univ. Melbourne), 1956.

## Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Dawson, Peter Edgar Rowland, M.B., B.S., 1953 (Univ. Sydney), 133 De Boos Street, Temora.

Ferguson, William John, M.B., B.S., 1952 (Univ. Sydney), 27 Smart Street, Fairfield.

## Deaths.

THE following deaths have been announced:

FINLAY.—Donald Francis Finlay, on April 22, 1956, at the Repatriation General Hospital, Concord, New South Wales.

JAMIESON.—Hugh Hunter Jamieson, on May 2, 1956, at North Sydney.

## Diary for the Month.

MAY 14.—Victorian Branch, B.M.A.: Finance Subcommittee.

MAY 15.—New South Wales Branch, B.M.A.: Medical Politics Committee.

MAY 16.—Western Australian Branch, B.M.A.: General Meeting.

MAY 17.—Victorian Branch, B.M.A.: Executive of Branch Council.

MAY 22.—New South Wales Branch, B.M.A.: Ethics Committee.

MAY 23.—Victorian Branch, B.M.A.: Branch Council.

MAY 24.—New South Wales Branch, B.M.A.: Clinical Meeting.

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

*New South Wales Branch* (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

*Queensland Branch* (Honorary Secretary, B.M.A. House, 22b Wickham Terrace, Brisbane, B17): Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

*South Australian Branch* (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

*Western Australian Branch* (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all contract practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

## Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

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